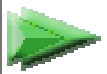


Complying with Washington's Ergonomics Rule:

Ergonomics Awareness Education

*This does not apply to you **IF** you don't have any Caution Zone Jobs*

Click to Start



Visit us at <http://www.lni.wa.gov/wisha>



STATE OF WASHINGTON



DEPARTMENT OF LABOR AND INDUSTRIES

Dear Employer:

This letter explains the awareness education requirements of the Ergonomics Rule.

Does this Ergonomics Awareness Education Kit meet the education requirements of the Ergonomics Rule?

Yes, as long as you do all of the following:

- Present the education to employees in caution zone jobs and their supervisors.
- Cover all six categories of caution zone risk factors when giving the presentation.
- Provide the required handouts to all attendees (see the [*Instructor's Guide*](#)).

Do I have to use these materials to comply with the Ergonomics Rule?

No. This Ergonomics Awareness Education Kit is one option. You may choose to provide the education in another way, as long as the education provides the required information listed in the Ergonomics Rule.

Am I required to keep records showing that I have presented this education?

No. Keeping a list of who attended the presentation may be a good idea for some employers, but the Ergonomics Rule does not require it, and a failure to keep records cannot be the basis for a violation.

If you have further questions about complying with the awareness education requirements of the Ergonomics Rule, please contact us at:

1-800-4BE-SAFE

(1-800-423-7233)

or visit our web page at

<http://www.lni.wa.gov/wisha/ergo/Default.htm>

or write us on line to

ergonomics@lni.wa.gov

Ergonomics Awareness Education for Employees in “caution zone jobs” and their supervisors

WHAT TO DO	HOW TO DO IT	DONE
1. Read the “instructor’s guide”	Print and review this four pages document (Instructor’s guide)	<input type="checkbox"/>
2. Prepare the class	<ul style="list-style-type: none"> • Study the slides and the instructors’ notes. • Customize the slides and other materials to your business needs • Copy the required handouts and other materials you may need <p style="text-align: right;">(Slides’notes) (Required handouts) (Optional handouts)</p> <p style="text-align: center;">OR</p> <p>Use your own Ergonomics Awareness Education materials</p>	<input type="checkbox"/>
3. Present the class	<p>In a quiet room,</p> <ul style="list-style-type: none"> • Present the slideshow • Provide handouts • Ask questions and encourage employee participation in the discussion <p style="text-align: right;">(Slideshow)</p>	<input type="checkbox"/>
4. Present certificate of achievement	<p>Print and handwrite the name of each employee that attended the class</p> <p style="text-align: right;">(Certificate of achievement)</p>	<input type="checkbox"/>
5. Evaluate in 6 months , ask employees about their experience with ergonomics improvements.		

Complying with Washington's Ergonomics Rule:

Ergonomics Awareness Education

Slide show

Instructor's Guide

- [Purpose of this educational session](#)
- [Getting Ready](#)
- [Customizing the presentation](#)
- [Presenting the ergonomics education](#)
- [Follow up](#)



<http://www.lni.wa.gov/wisha>



Ergonomics Awareness Education

For Employees in Caution Zone Jobs and Their Supervisors

Instructor's Guide

Purpose of this educational session

You may use this slide presentation to comply with the awareness education requirements of the [Washington state ergonomics rule \(WAC 296-62-051\)](#). You may read the requirements for employee awareness education in the rule at the end of this guide

You may also choose to use different materials if you believe that they will be more effective. The Department of Labor and Industries has produced a video version of our material that, along with some handouts and discussion, can also be used to comply with the rule's requirements. The video is available to you at no cost through our [Video Library](#) (1-800-574-9881).

GETTING READY

1.- Resources and Materials you will need:

- A quiet room with basic accommodations for comfort of participants
- A copy of the presentation (computer slide show, overheads, or handouts)
- Overhead projector or computer and projector for powerpoint presentation
- Copies of the handouts. Three are required and eight are optional, including the following:
 - **Required :**
 - [Employee involvement](#)
 - [Symptoms Reporting](#)
 - [Requirements of the Ergonomics Rule](#)
 - **Optional :**
 - [The Ergonomics Rule](#)
 - [Caution Zone Jobs Checklist](#)
 - [Appendix B/Hazard Zone Jobs Checklist](#)
 - [Neutral Posture](#)
 - [Core Ergonomic Control Methods - Examples](#)
 - [Instructor's Guide](#)
 - [Sample Roster Sheet](#)
 - [Certificate of Achievement](#)
- Any props you want to use (for example: tools that the employees use, or a jumper cable clamp to talk about hand force).

2.- Review the presentation materials.

Take the time to look through each of the slides and read the instructor's notes that come with each slide. If you have any questions after looking through these materials, be sure to contact your local L&I office (see page 3) for assistance before you give your first presentation.



3.- Customizing the presentation.

The presentation must cover all of the risk factors even if they are not present in your company. For example, you may not have any hand-arm vibration exposure in your company, but you need to discuss vibration anyway in order to prevent employees' exposure outside of the workplace.

The education may be more effective if employees see and hear about examples that they are familiar with, so it will help to include actual examples from your company in the presentation. Simple ways to do this include:

- Discussing which jobs within the company have specific caution zone risk factors as you talk about each one. (For example: "One place that we have highly repetitive motions is when we polish the widgets by hand.")
- Talking about any good examples in the company where ergonomic solutions have already been put into place to reduce risk factors. (For example: "We use a conveyor in the shipping area to move heavy boxes down the line so that no one has to do any heavy lifting.")
- Describing your company's procedures for involving employees and for reporting symptoms of WMSDs. (For example: "Each of you who works in a caution zone job will be asked to help look for hazards and brainstorm for solutions." and "If you have any of these symptoms, let your supervisor know right away.").
- Determining when your company has to comply with the different requirements of the rule, and communicating these dates to your employees during the presentation. (For example: "We'll need to have all of our jobs evaluated by July of 2003 and we'll need to have all of the fixes in place by July of 2004.").

Substituting pictures from within your company as examples in place of the generic pictures of risk factors and solutions. There are several ways to get digital pictures to insert into the presentation, such as:

- Use a digital camera and download the images to your computer.
- Take standard photographs and have your film developed someplace where they offer to put digital versions of your pictures onto a PhotoCD or onto a web site.
- Take standard photographs and then scan them into the computer. (Note: Larger prints, such as 4"x5", on matte film usually scan in the best.)

You can also take videotape of workers in caution zone jobs and show these as examples during the presentation. Video can be more effective in showing risk factors like highly repetitive motions or frequent lifting that are more dynamic than risk factors like awkward postures.

4.- Prepare the materials and schedule the class

- If you have a computer video projection system, then all you need to do is check to make sure the presentation works and make copies of the handouts. If you plan to use an overhead projector, you can print the slides out on transparencies. The photographs will be clearer if they are printed in color. If you don't have a color printer, it may be worthwhile to see if your local print or copy store can print out color transparencies for you.
- Schedule the class for a date and time convenient to most people. If you want many employees and supervisors to participate, try not to make groups larger than 15 attendees.



PRESENTING THE ERGONOMICS EDUCATION

1 - Give the presentation.

It will be better if you use your own words rather than just reading from the script. Give the handouts to all of the attendees.

2 - Ask for participation

It also helps to involve the audience as much as possible by asking them questions and getting them to talk about their own jobs and how to solve problems. If you have put some ergonomic solutions into place, ask the employees who are using them if they have made a difference in how they do their jobs. If anyone has had a work related musculoskeletal disorder (WMSD), see if they are willing to talk about the injury and the impact it has had on their work and home life.

3 - Questions and answers

Answer any questions the best that you can. Even if you don't have the technical knowledge to answer a lot of questions on ergonomics, you can still answer the important questions about the way that your company will be implementing ergonomics. If any questions do come up that you need help answering, get in touch with your local L&I office using the contact information on the following page.

FOLLOW UP

Within a week or two of giving the awareness education, you might want to take a few minutes to talk to some of the employees and supervisors to make sure they understood what was presented and how it applies to them. Take this opportunity to reinforce the importance of employee involvement in your company's ergonomics efforts.

GETTING HELP

If you have questions while preparing to give this presentation, or if questions come up during the presentation that you need help in answering, use the list below to contact your local L&I office for assistance:

City	Telephone #	E-mail address
Everett	425-290-1382	Claudia Kelley keld235@lni.wa.gov
Seattle	206-515-2837	Mark Soltow solt235@lni.wa.gov
Spokane	509-324-2621	Linda Bronson brl235@lni.wa.gov
Tacoma	253-596-3919	Jerry Hansen hanf235@lni.wa.gov
Tumwater	360-902-5799	Dana Wilcox widn235@lni.wa.gov
Yakima	509-454-3700	Jack Patton patc235@lni.wa.gov



Awareness Education Requirements in the Ergonomics Rule

WAC 296-62-05120 Which employees must receive ergonomics awareness education and when?

- (1) Employers must ensure that all employees working in or supervising “caution zone jobs” receive ergonomics awareness education at least once every three years. The employer may provide ergonomics awareness education or may rely on education provided by another employer or organization. Ergonomics awareness education materials provided by the Department Of Labor and Industries may be used to meet these requirements.
- (2) When employees are assigned to work in or supervise “caution zone jobs,” they must receive ergonomics awareness education within 30 calendar days, unless they have received it in the past three years. This requirement applies when the initial “awareness education” deadline in the implementation schedule (WAC 296-62-05160) has passed.

WAC 296-62-05122 What must be included in ergonomics awareness education?

Ergonomics awareness education (for example: Oral presentations, videos, computer-based presentations, or written materials with discussion) must include:

- Information on work-related causes of musculoskeletal disorders, including all caution zone risk factors listed in WAC 296-62-05105 (non-work factors may be included as well);
- The types, symptoms and consequences of WMSDs and the importance of early reporting;
- Information on identifying WMSD hazards and common measures to reduce them; and
- The requirements of this ergonomics rule.

Complying with Washington's Ergonomics Rule:

Ergonomics Awareness Education

Slideshow

Slides' notes

- [First slide](#)
- [Definition of Ergonomics](#)
- [Benefits of Ergonomics](#)
- [Awkward postures](#)
- [High hand force](#)
- [Highly repetitive motion](#)
- [Repeated impacts](#)
- [Lifting](#)
- [Hand – arm vibration](#)
- [Why is it important to report symptoms early?](#)
- [Six key points to remember](#)



<http://www.lni.wa.gov/wisha>



Ergonomics Awareness Education

For employees in caution zone
jobs and their supervisors

This ergonomics awareness education is required for all employees and their supervisors working in caution zone jobs, as determined by the Ergonomics rule of the State of Washington.

Throughout this presentation four colors were utilized in the slide design to facilitate the understanding of the different types of information presented:

- BLUE - is used in all slides with regulatory content or emphasis
- YELLOW - information about risk factors in the caution zone
- RED - information about risk factors in the hazard zone
- GREEN - in all slides discussing ideas, solutions and prevention

By the end of this presentation you will be able to:

1. Define ergonomics and its benefits
2. List the requirements of the Washington State Ergonomics Rule
3. Identify work activities that can lead to injury
4. List examples of ergonomic principles that reduce risk of injury



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By the time we're done with this presentation, you will have learned to:

- Define ergonomics and list the benefits of good ergonomics in the workplace
- Know what the requirements of the Washington state ergonomics rule are and how they apply to your job
- Identify and explain work activities that can lead to injury
- Recognize and use ergonomics principles to protect you on the job you do; from injuries to the muscles, tendons, ligaments, joints and nerves.

By the end of this presentation you will be able to:

5. Participate in your company's ergonomic efforts
6. Identify parts of the body that get injured at work
7. Recognize and report signs and symptoms of injury early



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By the end of this presentation you will also be able to...

- Participate in your company's efforts to find and fix hazards
- Identify the parts of your body that could get injured while doing your job
- Understand the importance of recognition and early reporting of signs and symptoms of injury, including how to report and who to report to

WMSDs?

Work-related
Musculo
Skeletal
Disorders



1-800-4BESAFE

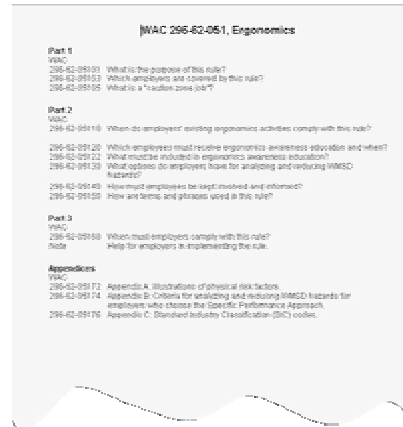
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The letters WMSDs is the abbreviation (acronym) used to name the group of injuries and diseases that affect the muscles, bones, tendons, joints, ligaments and nerves, and its cause is related to the work people do regularly.

Its extended name is Work-related Musculo Skeletal Disorders

Safety, health and the ergonomics rule

- Education on injury prevention is an important part of safety and health
- There are thousands of injuries, known as WMSDs, in Washington state every year
- Washington state has an ergonomics rule to help prevent these injuries



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Your health and safety is our primary concern.

- In order to help ensure your safety, Washington has safety and health rules.
- One of the most common types of injuries in our state is WMSDs - work-related musculoskeletal disorders.
- In order to help prevent these injuries, Washington state has a rule that requires companies to implement ergonomics in their workplaces.

Note: This section of the presentation (slides 5-10) is included to comply with the following section of the ergonomics rule -

WAC 296-62-05122 What must be included in ergonomics awareness education?

Ergonomics awareness education (for example: Oral presentations, videos, computer-based presentations, or written materials with discussion) must include:

- The requirements of this ergonomics rule.

The Washington State Ergonomics Rule

Applies only to “caution zone jobs”

- Caution zone jobs may not need to be fixed
- Caution zone jobs must be analyzed to see if they reach the hazard zone level



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The ergonomics rule requires that employers identify jobs with risks for injury, called “caution zone jobs” and then provide educational material like this presentation to employees in those jobs.

If you’re here listening to this presentation, it’s probably because you work in a caution zone job. This doesn’t mean that your job is going to injure you or is unsafe, but it does mean that you should be more aware of some of the risks you may face on the job.

- Caution zone jobs may not need any changes, though. Many times these jobs can still be done safely.
- Caution zone jobs first need to be analyzed to see if the risk of injury reaches the hazard zone or not.

You need to be exposed to a greater risk of injury before a caution zone job becomes a hazard zone job.

The Washington State Ergonomics Rule

Prevents you from working in “**hazard zone jobs**”, because...

- Hazard zone jobs have greater exposure to risk factors than caution zone jobs
- Hazard zone jobs must then be fixed to reduce the exposure



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The Washington State Ergonomics Rule has established limits to working in caution zone jobs conditions, to keep you healthy and prevent injuries on the job.

Caution zone jobs first need to be analyzed to see if the risk of injury reaches the hazard zone or not.

- You need to be exposed to a greater risk of injury before a caution zone job becomes a hazard zone job, for example, longer exposure times or combinations of risks at the same time.
- If a job does reach the hazard zone, then changes must be made to your job to reduce the exposure to injury risks.

The Washington State Ergonomics Rule

Promotes employee involvement and participation together with employers to analyze and fix hazards

– **You** play an important part...



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The ergonomics rule promotes and encourage employees to work together with employers in

- analyzing caution zone jobs and
- in the selection of measures to reduce WMSDs hazards.

Note: The relevant requirements in the ergonomics rule are:

WAC 296-62-05140 How must employees be kept involved and informed?

(1) The employer must provide for and encourage employee participation in analyzing “caution zone jobs” and selecting measures to reduce WMSD hazards. Employers with eleven or more employees who are required to have safety committees (WAC 296-24-045) must involve this committee in choosing the methods to be used for employee participation.

(2) Employers with eleven or more employees must share the following information with the safety committee (if a committee is required by WAC 296-24-045). Employers who are not required to have a safety committee (WAC 296-24-045) must provide this information at safety meetings:

- The requirements of this rule;
- Identified “caution zone jobs”;
- Results of the hazard analysis and/or identification of jobs with WMSD hazards; and
- Measures to reduce WMSD hazards.

(3) The employer must review its ergonomics activities at least annually for effectiveness and for any needed improvements. This review must include members of the safety committee where one exists or ensure an equally effective means of employee involvement.

...**You** can play an important part

- **You** may be asked to participate in:
 - Analyzing caution zone jobs for hazards
 - Finding solutions to these hazards
 - Evaluating the success of the solutions
- Later, **you** may...
 - be given job specific training on proper use of solutions
 - keep in touch with ergonomics efforts through the safety committee or at safety meetings.



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If you are in a caution zone job,

- Then we need to work with you to look more closely at your jobs to see if it is hazardous.
- If your job reaches the hazard zone, we then need to find ways to fix your job.
- This may include steps like coming up with new work methods or changes to equipment, so that they're no longer hazardous.
- Employees will also be part of evaluating the fixes to make sure that they work. You or some of your co-workers will be involved in these activities.
- If fixes are made to your job, then you should also get training on how to do your job with those fixes in place.

You can keep up to date on the progress of the ergonomics activities through our safety committee (or whichever method you choose to comply with the employee involvement requirements in the rule).

Note: The relevant requirements in the ergonomics rule are:

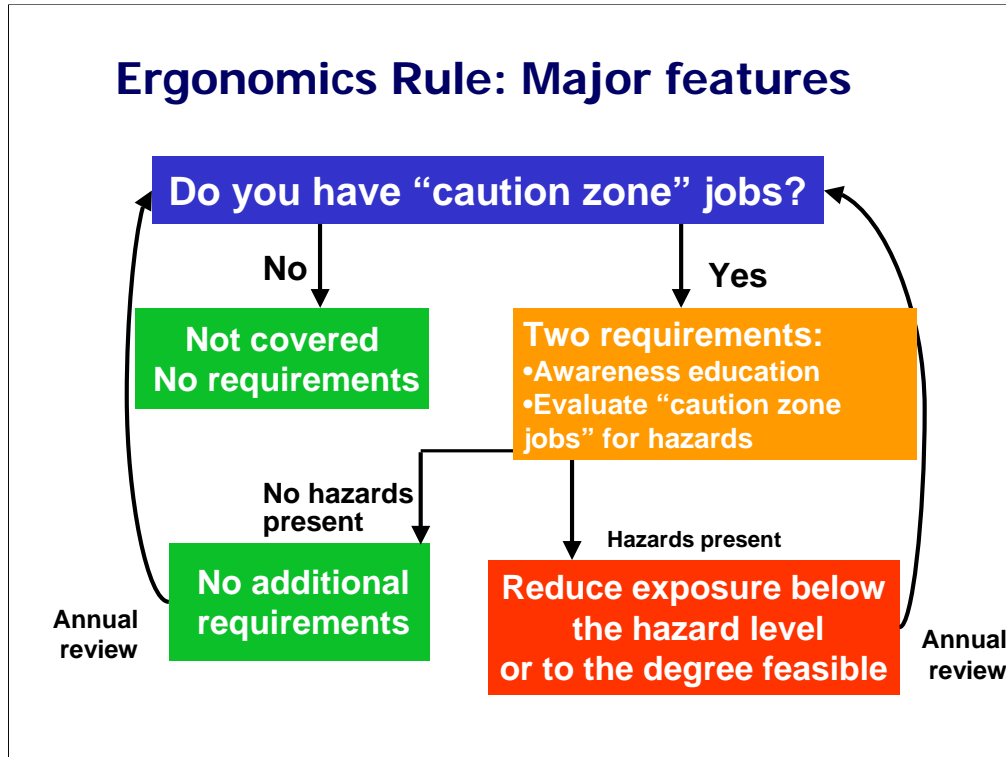
WAC 296-62-05140 How must employees be kept involved and informed?

(1) The employer must provide for and encourage employee participation in analyzing “caution zone jobs” and selecting measures to reduce WMSD hazards. Employers with eleven or more employees who are required to have safety committees (WAC 296-24-045) must involve this committee in choosing the methods to be used for employee participation.

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- The requirements of this rule;
- Identified “caution zone jobs”;
- Results of the hazard analysis and/or identification of jobs with WMSD hazards; and
- Measures to reduce WMSD hazards.

(3) The employer must review its ergonomics activities at least annually for effectiveness and for any needed improvements. This review must include members of the safety committee where one exists or ensure an equally effective means of employee involvement.



- This is another way to look at the basic requirements of the rule. In yellow are the requirements for caution zone jobs. If hazards are found, the job moves into the hazard zone in red. If there are no hazards, the job is OK and is in the green area where nothing more needs to be done.

- The reason why you need to understand the way the ergonomics rule works is that employees need to be involved in a lot of these steps.

- You may want to take a look at the rule itself, especially the descriptions of caution zone jobs. That way you can decide for yourself if your job is a caution zone job or not.

At this point you can offer to share a copy of the rule with the trainees, or direct them to the L&I web site to download their own copy

Definition of ergonomics

- Ergonomics means

“fitting the job to the worker”

“Ergonomics is the science and practice of designing jobs and workplaces to match the capabilities and limitations of the human body.”



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- Ergonomics is the scientific study of people at work.
- The goal of ergonomics is to create jobs, tools, equipment and workplaces that fit people, rather than making people adapt to fit them.
- An important part of ergonomics is making sure that the demands of the job do not go beyond what a worker can do safely. Let's take a look at an example of what can happen on a job where the demands created a problem and ergonomics was used to solve it.

Ergonomics @ Work



Risk of injury - Heavy lifting



Cart reduces risk of injury



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These pictures show the difference between lifting and moving something heavy and awkward by hand (in this case a roll of carpet) and moving the same thing with the help of a co-worker and mechanical assistance (in this case a carpet dolly).

- You can see where lifting by hand might create a risk for back or shoulder injury.
- The science of ergonomics teaches us that using the dolly puts a lot less strain on the back and shoulders, and it's also less tiring overall. The worker who gets help is a lot more likely to have a little energy left at the end of the day, and in the long run is a lot less likely to have injuries and miss work.

Help may not always be available and it may not always be possible to use mechanical assistance. In some cases this type of help isn't even needed. But when it is available and makes the job easier, then there's no reason not to use it.

- Ergonomics can be as simple as using a dolly to move something instead of lifting by hand.
- Ergonomics is about making jobs easier and reducing the risk of injury.

Benefits of ergonomics

- Ergonomics helps to prevent injuries
- Ergonomics has other benefits
 - Improved quality of work
 - Improved quality of life
 - Reduced fatigue and discomfort



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So, we can see that ergonomics isn't just a science...

- it's a tool; a tool that can be used to improve jobs and make them safer.

Changing jobs so that they better fit the workers has other benefits as well.

- Workers are often able to do a better job because they have more energy and can concentrate on the work.
- Workers feel also less tired at the end of the day, so they can enjoy life outside of work more.

Remember, there are a lot of changes that you can make to the way you do your job that will make it both safer and better.

Injuries and risk factors



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The following section of this presentation will describe the types of injuries that could result from working with risk factors and ways to reduce the exposure to them.

Injuries and risk factors

- What are **W**ork-related **M**usculo **S**keletal **D**isorders (**WMSDs**)?
- Common types and symptoms of injury
- Causes and prevention of injury



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Now that we've given you a definition of ergonomics, told you about the ergonomics rule, and discussed some of the benefits of ergonomics, we'll next look at the types of injuries that ergonomics can prevent, what their symptoms are, what types of work demands can help cause them, and ways to prevent these injuries.

Note: This section of the presentation (slides 14-60) is included to comply with the following section of the ergonomics rule -

WAC 296-62-05122 What must be included in ergonomics awareness education?

Ergonomics awareness education must include:

- Information on work-related causes of musculoskeletal disorders, including all caution zone risk factors listed in WAC 296-62-05105 (nonwork factors may be included as well);
- The types, symptoms and consequences of WMSDs and the importance of early reporting;
- Information on identifying WMSD hazards and common measures to reduce them;

What are Work-related Musculo Skeletal Disorders (WMSDs)?

- Also known as:
 - Cumulative Trauma Disorders (CTDs)
 - Repetitive Strain Injuries (RSIs)
 - Overuse injuries
- Soft tissue injuries
- Usually develop gradually, but sometimes can appear suddenly
- Can be serious, if not taken care of early



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•These injuries are called work-related musculoskeletal injuries, or WMSDs. You may have heard of these injuries by another name, such as cumulative trauma disorder, or CTD; repetitive strain injury, or RSI; or overuse injuries.

•WMSDs affect the soft tissues of the body - the muscles, tendons that connect muscles to bones, ligaments that connect bone to bone, nerves, blood vessels, pretty much every part of your body that's not a bone or internal organ.

These are the parts of your body that are prone to injury when demands on them go beyond what they can handle. Typically these injuries occur in your body's joints, the moving parts of the body like your low back, wrist, shoulder, elbow and knee.

•These are the parts of your body that get used the most and that are placed under the most stress during the day.

Often these injuries start out small, as a little muscle pull or a slightly irritated tendon. However, if a small injury isn't given a chance to heal, it can become aggravated, especially if you keep doing the activity that caused the injury in the first place.

Over time, these small injuries can build until they become chronic, which means they stay with you a long time.

•Usually these injuries take months or even years to occur, but sometimes they can appear to come on suddenly, such as "throwing out your back" when lifting or bending over.

•A severe WMSD can be a pretty serious, some even require surgery. The good news is, if you report symptoms early and get them taken care of, then they don't have to turn into a WMSD.

What are some of the symptoms of WMSDs?

- Discomfort
- Pain
- Numbness
- Tingling
- Burning
- Swelling
- Change in color
- Tightness, loss of flexibility



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WMSDs have many different symptoms, many of which you may have experienced at one time or another. These include...

- discomfort, pain, numbness, tingling or burning sensations, swelling and inflammation, changes in skin color, and tight muscles or loss of flexibility in a joint.
- Having one or more of these symptoms doesn't necessarily mean you have an injury, though.

Everyone has had muscle aches or stiffness after working or exercising hard, especially when you're not used to it. Usually these symptoms go away as you rest or as you get used to the work.

That's different from symptoms of injury, which last longer or include things like numbness and tingling that mean something more serious might be going on.

Sometimes these symptoms might make it difficult to do your job or things around the house, or they might wake you up at night and keep you from getting a good night's sleep.

- The important thing is not to ignore what your body is trying to tell you.
- Often simple changes to the way you work are all that are necessary to prevent these symptoms from becoming a WMSD.

What causes WMSDs?

Risk Factors

- Awkward Postures
- High Hand Force
- Repetitive Motions
- Repeated Impacts
- Heavy, Frequent, or Awkward Lifting
- Moderate to High Hand-Arm Vibration



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There are many things that everyone does on the job and at home that could contribute to a WMSD if they are done for long enough periods of time. These activities are called “risk factors.” Risk factors include...

- working in awkward postures,
- using high hand force,
- performing repetitive motions,
- using your hand or knee to make repeated impacts,
- heavy, frequent or awkward lifting, and
- exposure to moderate to high levels of vibration.

Risk Factors

Risk of injury depends upon:

- Duration (how long)
- Frequency (how often)
- Intensity (how much)
- Combinations of risk factors



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Just because your job has risk factors, doesn't mean that you're going to have a WMSD, though. In fact, a little bit of exposure to some risk factors can actually be good for you.

Occasionally moving into awkward postures like reaching or bending will help to stretch and exercise your muscles. Similarly, if you occasionally do some lifting, especially if you do it properly, it can help to strengthen your muscles. This is the whole point behind exercising.

Whether or not a risk factor will result in a WMSD depends on...

- the duration, or how long you are exposed to it,
- the frequency, or how often you are exposed to it and how much rest you get in between
- the intensity, or how much of the risk factor there is (for example, how heavy is the object you lift, or how far over you have to bend to pick it up), and
- combinations of risk factors, where you are exposed to more than one risk factor at a time.

The more risk factors you have at once, the more likely an injury will occur.

Risk Factors

Duration

- usually need hours of exposure before risk factors become a concern
- Can be all at one time or cumulative over the day



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You need to be exposed to risk factors for quite a while before you can be injured by them.

- Remember, we're talking about hours of exposure here, not just minutes.

You don't need to be exposed to a risk factor for hours on end to increase your chance of being injured, though. For example, it's easy to see how working bent over for two hours straight could cause back strain. While it's less likely to cause an injury, you can also strain your back by working bent over 15 minutes at a time if it adds up to hours of exposure over the day.

- Something to keep in mind, it's not that these injuries occur from a single day of exposure. It's when you have these risk factors as a regular part of your job with multiple days of exposure that injuries can occur.

Risk factors for WMSDs

Awkward postures

Awkward postures module

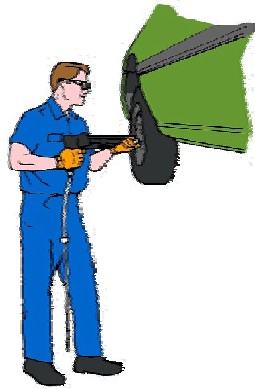
- “Awkward postures are body positions that stress the muscles and joints”

If you work in these positions too frequently or for too long at a time, the stress can result in injury.

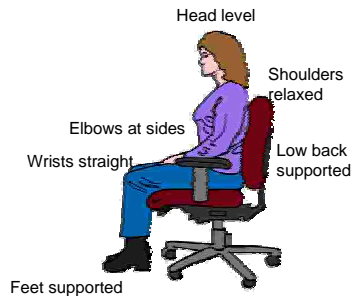
There are a number of different postures that you might get into at work or at home that feel awkward, and any of these might result in injury over time.

However, there are a limited number that are a known risk for injury at work, and those are the ones that we'll talk about in this presentation.

Neutral postures



Standing neutral posture



Seated neutral posture



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To understand what an awkward posture is, it helps to understand what it isn't.

•“A good posture is one that places the least amount of stress on your joints and muscles”. This is referred to as neutral posture.

It takes the strain out of your muscles and joints and allows them to work more efficiently.

This is what a standing neutral posture looks like:

- Keep all the parts of your body aligned
 - ears directly over shoulders,
 - shoulders over hips,
 - hips over knees,
 - knees over ankles.
- Look straight ahead with your head level, not twisted or bent.
- Relax your shoulders; don't hunch them or rotate them forward.
- Let your upper arms and elbows hang comfortably at your sides.
- Keep your wrists straight and in a handshake position.
- Stand with your legs straight, but with your knees relaxed, not locked back.

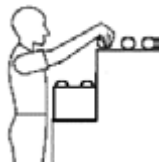
Seated neutral posture is pretty much the same, except:

- Support your low back using the chair's backrest.
- Support your feet by placing them flat on the floor or on a footrest, with your knees slightly lower than your hips.

While neutral posture places the least stress on your body, it wouldn't be good for you to stay in that position all day. Your body was designed to move around and is much happier when it's active.

Hands over head or elbows above shoulders

For more than 2 hours per day



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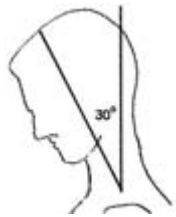
Some parts of your job may require you to move into or maintain postures that aren't neutral, and these are considered awkward postures.

They include things like the following:

- Working with your hands over your head or your elbows above your shoulders.
- Repetitively lifting your arms up overhead can lead to a shoulder or elbow WMSD.
- Holding your arms up overhead without bringing them down can also cause problems.

Neck bent more than 30°

For more than 2 hours per day



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Working with your neck bent forward too far can place strain on the neck muscles, especially if you hold this position for a long period of time.

Your head can weigh as much as a bowling ball, and that's a lot of weight for you neck muscles to hold up.

Over time, the muscles in your neck and shoulders can tighten up, resulting in chronic muscle soreness.

Back bent more than 30°



For more than 2 hours per day



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Similarly, working while bent over places a lot of strain on the muscles in your back.

Your upper body has more than half of your entire body weight. That's a lot for the muscles in your back to hold up, especially since those muscles are intended to hold you in an upright position.

Bending over like this also increases the pressure on the discs in your spine.

Squatting



For more than 2 hours per day



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Squatting is a good alternative to bending at the waist, but only for short periods of time.

If you squat for too long, it builds up pressure behind the kneecap, and it can cause damage to the knee.

Kneeling



For more than 2 hours per day

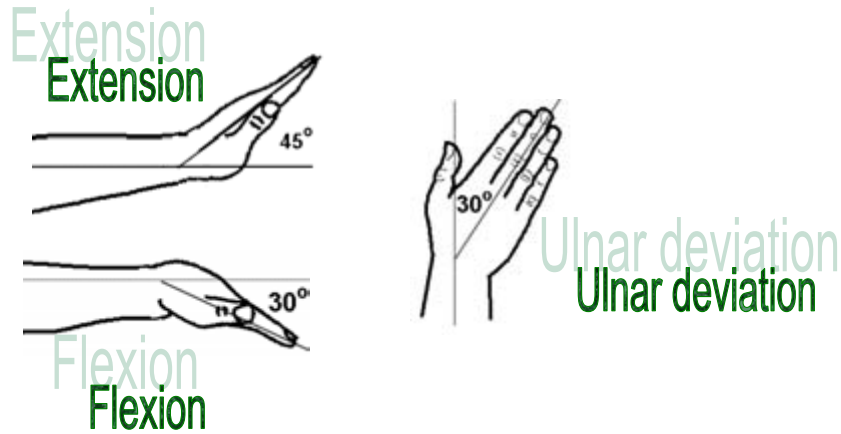


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Kneeling is another way to get down low, but it also causes pressure to build up behind the kneecap.

Wrists bent



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Working with your wrists bent in any of these directions also can be a problem.

However, bent wrists are only really a risk for injury when combined with high hand forces or repetitive motions, so we'll talk more about it later when we talk about those risk factors.

Reducing awkward postures

- Change workstation heights & display heights
- Tilt or rotate the work
- Use platforms
- Bring items within easy reach
- Pause to stretch



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Some jobs will always require awkward postures, but many can be done with fewer awkward postures or none at all with a few simple fixes. These include things like:

- Changing the height of a workstation or display
- Tilting or rotating the work to a better position
- Standing on a platform to bring you up closer to the work, or putting your work on a platform to bring it closer to you.
- Bringing items within easy reach
- Pause to stretch every once in a while if you do have to work in an awkward posture for any length of time

Reducing awkward postures

Case Study



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Case study

Before. The mechanic was kneeling for long periods. High pressure and tensions build up in his knee. Aches and pain were common after working in this posture.

After. A low stool with casters was the solution. This stool was available in the shop but not in use because of lack of training and awareness about the benefits of using it.

He could also work squatting or bending at the back, but both are also risk factors. A good option is rotate among these postures, without keeping one too long.

Try this:

Ask the participants to come up with some other solutions to avoid back bending or squatting

Risk Factors for WMSDs

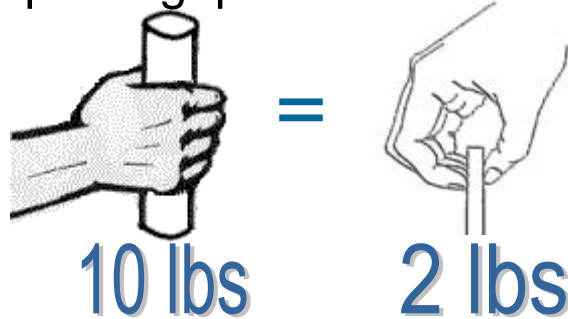
High hand force

High hand force

High hand force is developed when your hands or fingers hold or squeeze something that requires some effort. This can strain the muscles in your hands and arms as well as the tendons that attach the muscles to bones.

High hand force

A power grip can be 5 times stronger than a pinch grip



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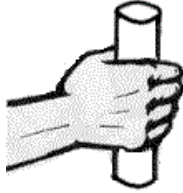
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The amount of force required to grip something depends on a number of factors; one of the most important of these is how you grip it.

- Gripping something with the whole hand, called a power grip, is 5 times stronger than gripping something with the fingertips, known as a pinch grip.
- So, picking up something that weighs 2 pounds with a pinch grip is just as stressful as picking up 10 pounds with a power grip.

Gripping with the whole hand

10 lbs. of weight or force for
more than 2 hours per day



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Since gripping with the whole hand allows you to use the stronger muscles in your forearms, it's not really considered high hand force until you grip something with more than 10 lbs. of force.

- This happens when lifting an object that weighs more than 10 lbs. per hand, or when squeezing something with more than 10 lbs. of force.
- An example of 10 lbs. of squeezing force is the force it takes to open a battery clamp on a pair of lightweight jumper cables.
- The example shown here is using cutters. While they don't weigh 10 lbs., they do require more than 10 lbs. of force to use.

Pinching with the fingertips

2 lbs. of weight or 4 lbs. of force
for more than 2 hours per day



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Pinching uses much smaller muscles in your hand, so picking up a 2 pound weight this way can be considered high force.

- It actually takes 4 lbs. of pinch force to hold a 2 lb object in order to keep it from slipping through your fingers,
- so the equivalent squeezing force with your fingertips is 4 lbs.
- You see pinching when using small tools or holding flat objects, such as the x-ray cassettes in this example.

Other factors

Your grip strength decreases when you:

- Bend your wrists
- Pick up slippery items
- Wear poorly fitting gloves
- Have cold hands



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When you bend your wrists, you actually lose a significant amount of your grip strength. This increases your risk of injury, especially to the wrist and elbow.

Try this exercise: Have every other person in the room grip a pencil in their hand with their wrist straight. Have the person next to them try to pull it out. Now have the person with the pencil bend their wrist and have the other person try to pull it out again. They should be able to pull it out much more easily this time.)

Other things can increase the amount of force needed to hold an object, such as:

- if it's slippery, or;
- if you wear loose fitting gloves or;
- your hands are exposed to cold

Any of the above make it difficult to feel what you are gripping.

Avoid pinch grips

- Pick objects up from the bottom using whole hand
- Attach handles or use lift tools
- Build up handles on small tools to reduce grip force



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One of the best ways to reduce grip forces is to use power grips instead of pinch grips wherever possible. Examples include:

- Picking objects up from the bottom using whole hand
- Attaching handles or use lift tools
- Building up handles on small tools to reduce grip force

Reduce power grip force

- Pick up smaller loads
- Use power tools instead of hand tools
- Keep tools in good working order
- Use lighter tools or tool balancers
- Use two hands
- Keep your wrists straight



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There are several things you can do to reduce the grip force you need to use to handle objects, including:

- Pick up smaller loads
- Use power tools instead of hand tools
- Keep tools maintained to reduce force required to operate them
- Use lighter tools or tool balancers
- Use two hands to cut force per hand in half
- Keep your wrists straight

Avoid holding onto objects for long periods

- Use clamps to hold onto work
- Place items on carts rather than carrying them
- Put down a tool when not actually using it



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Grip forces are also a problem if you hold onto an object for a long period. You can avoid this by:

- Using clamps to hold onto your work
- Placing items on carts rather than carrying them
- Putting down a tool when not actually using it

Use tool balancers

Case Study



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Case study

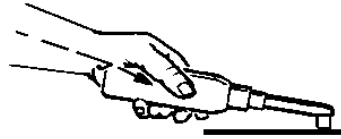
Before. Here's an example of someone using a heavy tool, a large impact wrench. It weighs about 25 lbs., so you know he's using more than 10 lbs. of force per hand.

After. In the example on the right, the tool is now on a portable balancer, a spring-loaded reel that takes the weight of the tool, making it essentially weightless. This greatly reduces the grip force needed to use the tool.

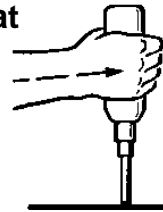
Tool use example



Working with bent wrists decreases grip strength



Use tools that let you keep your wrist straight



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When risk factors combine they are more likely to cause injury. For example, when you combine high hand force with bent wrists, an awkward posture, you're more likely to have a wrist injury.

- Remember that you lose grip strength when you bend your wrist.
- Here's an example of using a power tool with the wrist bent. He still needs to apply the same amount of force to get the job done, so he actually has to use more grip force than if his wrist were straight.
- He could reduce his risk of injury by using a different tool that allows him to keep his wrist straight, or moving the part into a different position so that he can use this tool with his wrist straight.

Risk factors for WMSDs

Highly repetitive motions

Highly repetitive motions

In the next section it will be discussed the reasons why moving the arms repeatedly may cause injuries; what are the limits the ergonomics rule has to prevent it to happen and means to prevent from getting injured

Highly repetitive motion

For more than 2 hours per day



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- “Motions are considered highly repetitive when you use the same part of your body to make an identical motion over and over again without pauses”.
- Most repetitive motions involve the hand, wrist, arm and shoulder, but there are also repetitive motions of the neck and back.

Making the same motion repeatedly can cause a lot of wear and tear on the joints being used, and if you don't rest to allow time for them to heal, the damage can just keep building up.

The example here is sorting apples, with repetitive grasping and reaching motions that can create a risk for hand, arm or shoulder injuries.

Reducing repetition

- Arrange work to avoid unnecessary motions
- Let power tools and machinery do the work
- Spread repetitive work out during the day
- Take stretch pauses
- Rotate task with co-workers if possible
- Change hands or motions frequently



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Repetitive motions may be required by your job. However, a lot of times you have some control over what motions you make and how often you make them.

Things you can do to reduce repetitive motions include:

- Arrange work to avoid unnecessary motions
- Let power tools and machinery do the work
- Spread repetitive work out during the day
- Take stretch pauses
- Rotate tasks with co-workers if possible
- Change hands or motions frequently

Reducing repetitive motions

Case Study



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Case study

Before. Here's an example of someone using a ratchet wrench to loosen and tighten bolts. Estimate the number of times the hand is twisting in and out each bolt. Observe the posture of the wrist and the force required.

After. Using a small power wrench to do the same job. You can see that it doesn't require repetitive motions; the wrist is in neutral posture and it's also a lot quicker.

Can anyone see any risk factors that the new tool creates, though?

There is some hand-arm vibration due to the type of tool being used. However, since it's so much faster to use, the duration may not be a problem.

Intensive keying

For more than **4** hours per day



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Intensive keying, as opposed to intermittent keying, is a special kind of repetitive motion.

- It involves highly repetitive movements of the fingers for a long duration - four or more hours per day - doing tasks like data entry or transcription.
- While your fingers are moving rapidly, the rest of your body is essentially held in one position.
- The repetitive movements create a risk for hand or wrist injuries.
- However, intensive keying can be stressful for your whole body, especially if you work in awkward postures as well.

Reducing intensive keying

- Spread keyboard work throughout the day
- Use macros for common functions
- Take stretch pauses
- Improve your posture and move around as much as possible



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There are several things you can do to reduce risk of injury from intensive keying, including:

- Spread keyboard work throughout the day
- Use macros for common functions (macros are small programs on your computer that automate repetitive key strokes)
- Take stretch pauses
- Improve your posture (remember neutral posture?) and move around as much as possible

You can apply these same principles when using your computer at home, too.

Risk factors for WMSDs

Repeated impacts

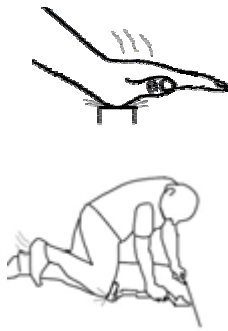
Repeated impacts

Pounding with the palm of the hand or with the knee onto a hard object or surface is a major stressor for the soft tissues in these parts of your body.

This section describes the repeated impact characteristics in the ergonomics rule and the use of ergonomics principles to prevent injuries.

Repeated impacts

Using the hand or knee as a hammer more than 10 times per hour, more than 2 hours per day



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There are many soft tissues in the palm of your hand that are easily damaged when using the palm as a hammer.

- such as in this example putting hubcaps back on.
- Similarly, repetitively using your knee as a hammer, such as this carpet layer is doing to stretch the carpet using a knee kicker, can damage many of the same soft tissues that kneeling damages.

Avoiding repeated impacts

- Use tools instead of your hand or knee



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Use tools instead of your hands or knees

Fortunately there are easy solutions to these risk factors.

- Tools like rubber mallets can be used in place of the palm in many cases.
- Power stretchers are available for carpet layers that don't require using a knee kicker.

Risk factors for WMSDs

Heavy, frequent or awkward lifting

Heavy, frequent or awkward lifting

Lifting loads against gravity places major stresses to the lower back. Perhaps more than one of you attending this class has gone through a back pain in their lives.

The following discussion will be centered on how the risk factors most likely occur and means to reduce them and prevent injuries to the back.

Heavy lifting

- Lifting 75 lbs. once per day
- Lifting 55 lbs. more than 10 times per day



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Most people are aware that lifting heavy objects increases the risk for injury.

- The load on the low back when lifting something heavy can strain the muscles and eventually damage the disks in your spine.
- The load can strain the muscles in the shoulders and upper back as well.
- Pay attention to the maximum heavy weight you may lift and how many times a day before getting the risk of injury:
 - 75 pounds, once a day
 - 55 pounds more than 10 times a day

Reducing heavy lifting

- Take smaller loads at one time
- Use mechanical assistance - handtrucks, carts, hoists, conveyors
- Get help from a co-worker



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There are several things you can do to reduce the load that you have to lift, including:

- Take smaller loads at one time
- Use mechanical assistance:
 - handtrucks,
 - carts,
 - hoists, or
 - conveyors to move the load rather than lifting and carrying it
- Get help from a co-worker

Frequent lifting

- Lifting more than 10 lbs., more than twice per minute, for more than 2 hours per day



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Many people don't realize that repetitive lifting can be just as hazardous as heavy lifting because of the fatigue it causes.

When you lift frequently you can tire out the muscles, making them more prone to injury.

If your muscles can't handle the load, the strain can be shifted to your joints and the disks in your spine, placing them at risk for injury, too.

•Pay attention to the maximum weight you may lift and how many times a day before getting the risk of injury:

- 10 pounds, more than twice per minute, for more than 2 hours a day
- That is about 240 lifts a day, each one of 10 pounds or less

Reducing frequent lifting

- Use mechanical assistance
- Slide objects instead of lifting them
- Rotate lifting tasks with co-workers if possible



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- Look for alternatives to frequent lifting, including hand trucks, carts and other mechanical assistance.
- If you can roll, drag or slide something instead of lifting and carrying it, often times that will be better for your back.
- If you can, share lifting duties among co-workers so no one person has to do a lot of lifting.

Awkward lifting

- Lifting more than 25 lbs. above the shoulders, below the knees or at arms' length more than 25 times per day



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Lifting even moderate loads while bent over or reaching up or out can also place you at risk of injury, to either your back or your shoulders.

- When you bend over to pick something up from below your knees, not only does your back have to lift the object, but it also has to lift the weight of your upper body.
- Something else to keep in mind, the same stresses are there when you lower something as when you lift it.
- Pay attention to the maximum weights you may lift while in an awkward posture and how many times a day before getting the risk of injury:
 - 25 pounds, 25 times a day
 - That is a total about 625 pounds in a day, lifting above the shoulders, below the knee or at arms length

Reducing awkward lifts

- Store items where you won't have to bend or reach to lift them
- Use rolling stairs to get items down from high shelves



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- Avoid storing things on the floor unless you use a hand truck to move them, and
- Avoid storing heavy items above your shoulders.
- Place them on a surface between knee and waist level, instead.

Safe lifting technique



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(Try this exercise: Have someone in the class demonstrate their lifting technique on a box or another object. Have the rest of the class comment on what they did well and what they did that could increase their risk of injury. Then, have someone demonstrate proper lifting technique and highlight any differences.)

If you do have to lift...

- plan the lift first,
- know where you're going with something before you pick it up, and
- make sure you have a clear path and a good place to put it down
- check the weight of the load before you pick it up
- bring the load as close to you as possible before you lift it, and
- keep it close as you carry it and put it down.
- if you can bring it between your knees and lift with your legs, that's best
- keep your chest up and stick your hips out to minimize stress on your back.
- lift smoothly and move your feet; don't twist as you lift.
- if something is too large or heavy for you to comfortably lift on your own, get help.

Risk factors for WMSDs

Moderate to high hand–arm vibration

Moderate to high levels of vibration in the segment hand-arm

The vibration of hand-held vibrating tools is absorbed by the soft tissues of the hand and arm. The vibration that enters the body causes several responses like narrowing of the blood vessels which difficult the circulation. You may feel cramps or less force while grasping.

Vibration

Moderate levels
of vibration for
2 hours per day



High levels of
vibration for **30**
minutes per day



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Power tools can transmit vibration to the hands and arms, and this has a number of effects on the body. If you're exposed to enough vibration, it can cause damage to the blood vessels and nerves in your hands and arms. Vibration also tends to make the muscles tighten up.

- The tighter you grip the tool, the more vibration gets transmitted to your hands and arms, and this makes injury more likely.
- Some tools put out a high level of vibration, and this can start to have these effects on your body in as little as half an hour of use per day.
- Pay attention to the power tools you use and the minutes you actually have the tool held and the power "on" in your hand
 - Moderate vibration is safe at up to 2 hours a day
 - High vibration is safe at up to ½ hour a day

Reducing vibration

- Use low vibration tools if available
- Maintain tools →
- Use tool wraps or anti-vibration gloves
- Keep hands warm



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It takes quite a bit of vibration to actually cause an injury, but if you use a lot of power tools you should take all of the steps you can to reduce your exposure to vibration. These include:

- Use low vibration tools if available.
- Maintain tools to reduce vibration. Well maintained tools can often get the job done quicker, too. This reduces your exposure to vibration. This is the case with the example, where he's changing the grinding disk when it's worn. The new disk will help get the job done more quickly.

Another measures that may be practical are the use tool wraps with dampening materials, anti-vibration gloves and keeping your hands warm, to help keep good blood flow and feeling to your hands.

What **you** can do:

- Recognize and report symptoms **early**
- Get involved in ergonomics



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Next we'll talk about what to do if you have symptoms of a WMSD and how you can be involved in your company's efforts to prevent these injuries from occurring.

Note: This section of the presentation (slides 61-65) is included to comply with the following section of the ergonomics rule -

WAC 296-62-05122 What must be included in ergonomics awareness education?

Ergonomics awareness education must include:

- The types, symptoms and consequences of WMSDs and the importance of early reporting;

Symptom recognition and reporting

- Report symptoms if:
 - Pain is persistent, severe or worsening
 - Pain radiates
 - Symptoms include numbness or tingling
 - Symptoms keep you from sleeping at night



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Of course, it wouldn't make sense to report all the little aches and pains you experience. But how do you know when symptoms are serious enough to need attention? Report your symptoms if:

- Pain is persistent, severe or worsening.
- Pain radiates (spreads or “travels” down an arm or leg)
- Symptoms include numbness or tingling.
- Symptoms keep you from sleeping at night.

When in doubt, it's better to report symptoms and be told there's nothing wrong than to wait too long.

(Discuss your company's specific reporting policy with the employees at this point.)

Why is it important to report symptoms **early**?

- Chronic injuries sometimes lead to disability, even surgery
- Early treatment more successful



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Some WMSDs can become chronic, where symptoms don't go away, and these can be very serious. They can even result in lost work days, permanent disability, or even surgery.

However, the good news is that early treatment is often very simple and successful. Therefore, it's important for your own health to report symptoms as early as you can.

Getting involved

- Look at jobs and help identify problems
- Come up with solutions
- Work with solutions
- Take part in training
- Take responsibility for changing the way you do your job
- Help to make sure efforts are successful



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Now that you've learned something about ergonomics you can get involved. You or some of your co-workers may be asked to be involved in efforts to prevent WMSDs. For example, you may be asked to help...

- look at jobs with risk factors to see if hazards exist. Your input can be very helpful, since you are the expert on your job.
- If jobs are found to be hazardous, you may be asked to take part in coming up with solutions.
- If you have any ideas on how to fix the job, share them with us.
- If changes are made to your job, do the best you can to work with those changes since they're there for your safety.
- Take part in any training that comes along with the changes, so you'll be able to adapt quickly.

Once you get used to the changes you may find that they actually make your job easier. Your work habits are important, too, so

- you may need to change the way you do some parts of your job so that you can do them more safely

You should also try to apply the principles of ergonomics you learn to your home life as well. Finally, make sure

- you let us know whether the changes have worked or not.

Six key points to remember

- 1 Ergonomics can help you on your job
- 2 WISHA requires Washington state employers to implement ergonomics if caution zone jobs are present
- 3 Risk factors can be reduced and WMSDs prevented
- 4 You can help your company put ergonomics changes into place
- 5 WMSDs can happen in jobs with risk factors
- 6 Reporting symptoms **early** is important



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In summary, here are six key points to remember about ergonomics:

- 1 Ergonomics is a tool you can use to make your job safer and better.
- 2 Washington state has a rule that requires some employers to implement ergonomics in the workplace.
- 3 In jobs with enough exposure to risk factors, work-related musculo-skeletal disorders, or WMSDs, can occur.
- 4 By applying ergonomics, risk factors can be reduced and WMSDs prevented.
- 5 We can't stress this point enough: If you start having symptoms of a WMSD, be sure you report them early to avoid more serious injury.
- 6 You are the expert when it comes to your job, and you can play an important role in your company's ergonomics efforts. Ergonomics can be more than just a one-time fix. It can be an on-going process that you and your employer can use to make things better.

Thank you for your attention.

Complying with Washington's Ergonomics Rule:

Ergonomics Awareness Education

Slideshow

Required handouts

- [Employee involvement](#)
- [WMSDs symptoms](#)
- [Requirements of the ergonomics rule](#)



<http://www.lni.wa.gov/wisha>

REQUIRED



Ergonomics Awareness Education

For Employees in Caution Zone Jobs and Their Supervisors

Your Involvement in Ergonomics

You are an important part of our ergonomics efforts. During the coming months, we will be analyzing jobs to see if there are hazards present. If we find hazards, we'll be working together to try to find solutions, and then checking to make sure that any solutions we come up with are working.

Some of your co-workers have been asked to help with analyzing these jobs:

You are the expert in your job

They may be coming to talk to you about your job and maybe watch you work. Be sure to share any concerns or ideas for improvements you have with them. You are the expert when it comes to your job, so your input will be very valuable.

These co-workers will be helping to develop solutions for any hazards found:

Your job may not need to be changed, but if it is, you may also receive training on how best to work with the changes. If for some reason the changes aren't working for you, be sure to let your supervisor or one of the contacts listed above know about it.

REQUIRED



Ergonomics Awareness Education

For Employees in Caution Zone Jobs and Their Supervisors

What are WMSDs?

Work-related musculoskeletal disorders, or WMSDs, are injuries to the soft tissues of the body - the muscles, tendons that connect muscles to bones, ligaments that connect bone to bone, nerves, arteries and veins, pretty much every part of your body that's not a bone or internal organ. Pain is the most common symptom of these injuries.

When should I report symptoms?

Of course, it wouldn't make sense to report all the little aches and pains you experience. But how do you know when symptoms are serious enough to need attention? Report your symptoms if:

- Pain lasts more than 2 to 3 days in a row, severe or worsening.
- Pain spreads or "travels" down an arm or leg.
- Symptoms include numbness or tingling (hands or feet "falling asleep" or feeling of "pins and needles").
- Symptoms include feelings of weakness or loss of strength.
- Symptoms keep you from sleeping at night.
- Symptoms get worse while working.

When in doubt, it's better to report symptoms and be told there's nothing wrong than to wait too long.

What parts of the body do WMSDs affect?

WMSDs affect the parts of your body that are prone to injury when demands on them go beyond what they can handle. Typically these injuries occur in the moving parts of the body like your neck, low back, shoulder, elbow, wrist, and knee.

What are some of the symptoms of WMSDs?

WMSDs have many different symptoms, many of which you may have experienced at one time or another. These include:

- | | | |
|-------------------------|---------------------------|------------------------|
| • Discomfort | • Unusual sensations - | • Shooting or stabbing |
| • Pain | numbness, tingling, | pains in arms or legs. |
| • Swelling | burning, heaviness, "pins | • Weakness or |
| • Changes in skin color | and needles," or "falling | clumsiness in hands; |
| • Stiffness, tight | asleep"- of the hands or | dropping things. |
| muscles, or loss of | feet | |
| flexibility in a joint. | | |

Having one or more of these symptoms doesn't necessarily mean you have an injury, though.

What are some of the consequences of a WMSD?

Often these injuries start out small, as a little muscle pull or a slightly irritated tendon. It can become aggravated, especially if you keep doing the activity that caused the injury in the first place. The good news is that early treatment is often very simple and successful. Therefore, it's important for your own health to report symptoms as early as you can.

REQUIRED



Ergonomics Awareness Education

For Employees in Caution Zone Jobs and Their Supervisors

Requirements of The Ergonomics Rule

1. Employers are only covered by this rule if they have employees working in “caution zone jobs.” Caution zone jobs are typical work activities with exposure to one or more risk factors for work-related musculoskeletal disorders (WMSDs).
2. Employers covered by the rule must provide ergonomics awareness education to all employees who work in caution zone jobs and their supervisors. The video along with these handouts fulfills the requirements.
3. Employers must also work with employees to analyze caution zone jobs to see if the risk factors reach hazard levels.
4. If hazards are found, employers and employees must work together to find solutions to the risk factors, put them in place and check back to make sure they are working. This means, finding ways to reduce employee exposure below hazardous levels or to the degree feasible
5. Some solutions may require training along with their implementation.

If you want an actual copy of the rule you can call 1-800-4BE-SAFE (1-800-423-7233) to request a copy or you can download a copy from the website:
www.lni.wa.gov/wisha/ergo/

Complying with Washington's Ergonomics Rule:

Ergonomics Awareness Education

Slideshow

Optional handouts

- [The Ergonomics rule](#)
- [Caution zone jobs checklist](#)
- [Hazard zone jobs checklist](#)
- [Neutral posture](#)
- [Core ergonomics control methods - examples](#)
- [Roster sheet - sample](#)
- [Certificate of achievement -sample](#)



<http://www.lni.wa.gov/wisha>

WAC 296-62-051, Ergonomics

Part 1

WAC

- 296-62-05101 What is the purpose of this rule?
- 296-62-05103 Which employers are covered by this rule?
- 296-62-05105 What is a “caution zone job”?

Part 2

WAC

- 296-62-05110 When do employers’ existing ergonomics activities comply with this rule?
- 296-62-05120 Which employees must receive ergonomics awareness education and when?
- 296-62-05122 What must be included in ergonomics awareness education?
- 296-62-05130 What options do employers have for analyzing and reducing WMSD hazards?
- 296-62-05140 How must employees be kept involved and informed?
- 296-62-05150 How are terms and phrases used in this rule?

Part 3

WAC

- 296-62-05160 When must employers comply with this rule?
- Note Help for employers in implementing the rule.

Appendices

WAC

- 296-62-05172 Appendix A: Illustrations of physical risk factors.
- 296-62-05174 Appendix B: Criteria for analyzing and reducing WMSD hazards for employers who choose the Specific Performance Approach.
- 296-62-05176 Appendix C: Standard Industry Classification (SIC) codes.

PART 1

WAC 296-62-05101 What is the purpose of this rule?

The purpose of this rule is to reduce employee exposure to specific workplace hazards that can cause or aggravate work-related musculoskeletal disorders (WMSDs). In workplaces where these hazards exist, employers must reduce them. Doing so will prevent WMSDs such as tendinitis, carpal tunnel syndrome and low back disorders. The rule is not designed to prevent injuries from slips, trips, falls, motor vehicle accidents or being struck by or caught in objects.

This rule contains three parts.

- Part 1, WAC 296-62-05105, provides a quick way for employers to know if they are covered.
- Part 2 requires covered employers to meet an employee-education requirement and identify WMSD hazards. If hazards exist, the employer must reduce them.
- Part 3 shows covered employers when they must comply with this rule. An employer's type of business and number of employees determine how much time is permitted for compliance (3 to 6 years for fixing WMSD hazards).

The rule does not include any requirements for the medical management of WMSDs or change any requirements for handling industrial insurance claims. An employer will not be in violation of this rule solely because an employee develops a WMSD or related symptom.

WAC 296-62-05103 Which employers are covered by this rule?

Employers with "caution zone jobs" are covered by this rule. A "caution zone job" is a job where an employee's typical work activities include any of the specific physical risk factors listed in WAC 296-62-05105.

WAC 296-62-05105 What is a "caution zone job"?

"Caution zone"

A "caution zone job" is a job where an employee's typical work activities include any of the specific physical risk factors listed below. Typical work activities are those that are a regular and foreseeable part of the job and occur on more than one day per week, and more frequently than one week per year.

- Employers having one or more "caution zone jobs" must comply with Part 2 of this rule. "Caution zone jobs" may not be hazardous, but do require further evaluation.
- This rule does not prohibit "caution zone jobs."
- Employers who have made a reasonable determination that they do not have "caution zone jobs" are not covered by this rule.
- Duration (for example, 2 hours) refers to the total amount of time per day employees are exposed to the risk factor, not how long they spend performing the work activity that includes the risk factor.

Awkward Posture

- (1) Working with the hand(s) above the head, or the elbow(s) above the shoulder, more than 2 hours total per day
- (2) Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than 2 hours total per day
- (3) Squatting more than 2 hours total per day
- (4) Kneeling more than 2 hours total per day

High Hand Force

- (5) Pinching an unsupported object(s) weighing 2 or more pounds per hand, or pinching with a force of 4 or more pounds per hand, more than 2 hours total per day (comparable to pinching half a ream of paper)
- (6) Gripping an unsupported object(s) weighing 10 or more pounds per hand, or gripping with a force of 10 or more pounds per hand, more than 2 hours total per day (comparable to clamping light duty automotive jumper cables onto a battery)

Highly Repetitive Motion

- (7) Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds more than 2 hours total per day
- (8) Performing intensive keying more than 4 hours total per day

Repeated Impact

- (9) Using the hand (heel/base of palm) or knee as a hammer more than 10 times per hour more than 2 hours total per day

Heavy, Frequent or Awkward Lifting

- (10) Lifting objects weighing more than 75 pounds once per day or more than 55 pounds more than 10 times per day
- (11) Lifting objects weighing more than 10 pounds if done more than twice per minute more than 2 hours total per day
- (12) Lifting objects weighing more than 25 pounds above the shoulders, below the knees or at arms length more than 25 times per day

Moderate to High Hand-Arm Vibration

- (13) Using impact wrenches, carpet strippers, chain saws, percussive tools (jack hammers, scalers, riveting or chipping hammers) or other hand tools that typically have high vibration levels more than 30 minutes total per day
- (14) Using grinders, sanders, jig saws or other hand tools that typically have moderate vibration levels more than 2 hours total per day

(Employers may assume that hand tools vibrating less than 2.5 meters per second squared (m/s^2) eight-hour equivalent are not covered.)

PART 2

WAC 296-62-05110 When do employers' existing ergonomics activities comply with this rule?

Employers may continue to use effective alternative methods established before this rule's adoption date. If used, the employer must be able to demonstrate that the alternative methods, taken as a whole, are as effective as the requirements of this rule in reducing the WMSD hazards of each job and providing for employee education, training and participation.

WAC 296-62-05120 Which employees must receive ergonomics awareness education and when?

- (1) Employers must ensure that all employees working in or supervising "caution zone jobs" receive ergonomics awareness education at least once every three years. The employer may provide ergonomics awareness education or may rely on education provided by another employer or organization. Ergonomics awareness education materials provided by the department of labor and industries may be used to meet these requirements.
- (2) When employees are assigned to work in or supervise "caution zone jobs," they must receive ergonomics awareness education within 30 calendar days, unless they have received it in the past three years. This requirement applies when the initial "awareness education" deadline in the implementation schedule (WAC 296-62-05160) has passed.

WAC 296-62-05122 What must be included in ergonomics awareness education?

Ergonomics awareness education (for example: Oral presentations, videos, computer-based presentations, or written materials with discussion) must include:

- Information on work-related causes of musculoskeletal disorders, including all caution zone risk factors listed in WAC 296-62-05105 (nonwork factors may be included as well);
- The types, symptoms and consequences of WMSDs and the importance of early reporting;
- Information on identifying WMSD hazards and common measures to reduce them; and
- The requirements of this ergonomics rule.

WAC 296-62-05130 What options do employers have for analyzing and reducing WMSD hazards?

All covered employers must determine whether “caution zone jobs” have WMSD hazards and must reduce the WMSD hazards identified as described below.

Employers may choose either the General Performance Approach or the Specific Performance Approach as follows:

WAC 296-62-05130 - Analyzing and reducing WMSD hazards: General Performance Approach	WAC 296-62-05130 - Analyzing and reducing WMSD hazards: Specific Performance Approach
(1) The employer must analyze “caution zone jobs” to identify those with WMSD hazards that must be reduced. A WMSD hazard is a physical risk factor that by itself or in combination with other physical risk factors has a sufficient level of intensity, duration or frequency to cause a substantial risk of WMSDs. The employer must use hazard control levels as effective as the recommended levels in widely used methods such as the Job Strain Index, the lifting guidelines in the Department of Energy ErgoEASER, the ANSI S3.34-1986 (R1997) Hand Arm Vibration Standards, the 1991 NIOSH Lifting Equation, (as described in Waters 1993), the UAW-GM Risk Factor Checklists, applicable ACGIH threshold limit values for physical agents, Rapid Entire Body Assessment (REBA), or Rapid Upper Limb Assessment (RULA).	(1) The employer must analyze “caution zone jobs” to identify those with WMSD hazards that must be reduced. A WMSD hazard is a physical risk factor that exceeds the criteria in Appendix B of this rule.
(2) The employer must analyze "caution zone jobs" using a systematic method that includes the following, if applicable: <ul style="list-style-type: none">• Physical demands specific to the worksite including posture, force, repetition, repeated impacts, hand-arm vibration, duration, work pace, task variability and recovery time;• Layout of the work area, including reaches, working heights, seating and surfaces; and• Manual handling requirements, including size, shape, weight, and packaging.	(2) Same as General Performance Approach
(3) Individuals responsible for hazard analysis must know how to use the analysis method effectively and be informed about the requirements of this rule.	(3) Individuals responsible for hazard analysis must know how to use the analysis provided in Appendix B effectively and be informed about the requirements of this rule.
(4) The employer must reduce all WMSD hazards below the criteria chosen in WAC 296-62-05130(1) or to the degree technologically and economically feasible.	(4) The employer must reduce all WMSD hazards below the criteria in Appendix B of this rule or to the degree technologically and economically feasible.

WAC 296-62-05130 –Analyzing and reducing WMSD hazards: General Performance Approach (cont.)	WAC 296-62-05130 - Analyzing and reducing WMSD hazards: Specific Performance Approach (cont.)
<p>(5) Employers must reduce WMSD hazards as described below by:</p> <p>(a) Implementing controls that do not rely primarily on employee behavior to reduce WMSD hazards, such as the following:</p> <ul style="list-style-type: none"> • Changes to workstations and tools • Reducing the size and weights of loads handled • Process redesign to eliminate unnecessary steps or introduce task variety • Job rotation <p>(b) If employers cannot reduce WMSD hazards below the hazard level using the controls identified above, they must supplement those controls with interim measures that primarily rely on individual work practices or personal protective equipment. Examples of such practices include the following:</p> <ul style="list-style-type: none"> • Impact gloves • Team lifting • Training on work techniques <p>(c) This rule does not require an employer to control WMSD hazards by replacing full-time employees with part-time employees or otherwise reducing an individual’s hours of employment. If an employer has implemented all other technologically and economically feasible controls, and a WMSD hazard remains, the employer will be deemed in compliance with this subsection.</p>	<p>(5) Same as General Performance Approach</p>
<p>(6) If measures to reduce WMSD hazards include changes in the job or work practices then job-specific training must be provided. This job-specific training must include:</p> <ul style="list-style-type: none"> • The hazards of the work activities; • Safe work practices; and • The proper use and maintenance of specific measures to reduce WMSD hazards that have been implemented. 	<p>(6) Same as General Performance Approach</p>
<p>(7) No written ergonomics program is required. The employer must be able to demonstrate the following:</p> <ul style="list-style-type: none"> • The method used to analyze “caution zone jobs”; • The criteria used to identify WMSD hazards; • The jobs with identified WMSD hazards; and • The reduction of all WMSD hazards below the criteria chosen in WAC 296-62-05130(1) or to the degree technologically and economically feasible. 	<p>(7) No written ergonomics program is required. The employer must be able to demonstrate that all WMSD hazards have been reduced below the criteria identified in Appendix B of this rule or to the degree technologically and economically feasible.</p>

WAC 296-62-05140 How must employees be kept involved and informed?

- (1) The employer must provide for and encourage employee participation in analyzing “caution zone jobs” and selecting measures to reduce WMSD hazards. Employers with eleven or more employees who are required to have safety committees (WAC 296-24-045) must involve this committee in choosing the methods to be used for employee participation.
- (2) Employers with eleven or more employees must share the following information with the safety committee (if a committee is required by WAC 296-24-045). Employers who are not required to have a safety committee (WAC 296-24-045) must provide this information at safety meetings:
 - The requirements of this rule;
 - Identified “caution zone jobs”;
 - Results of the hazard analysis and/or identification of jobs with WMSD hazards; and
 - Measures to reduce WMSD hazards.
- (3) The employer must review its ergonomics activities at least annually for effectiveness and for any needed improvements. This review must include members of the safety committee where one exists or ensure an equally effective means of employee involvement.

WAC 296-62-05150 How are terms and phrases used in this rule?

Note: Check L&I's WISHA Services web site at <http://www.lni.wa.gov/wisha/ergo> for current links to any of the web sites referred to in this section.

ACGIH threshold limit values for physical hazards - The American Conference of Governmental Industrial Hygienists, Thresholds Limit Values for Chemical Substances and Physical Agents in the Work Environment, and Biological Exposure Indices (TLVs and BEIs). Available for purchase at the ACGIH web site at <http://www.acgih.org>.

ANSI S3.34-1986 (R1997) Hand Arm Vibration Standards - American National Standard Guide for the Measurement and Evaluation of Human Exposure to Vibration Transmitted to the Hand. ANSI S3.34-1986 (R1997). Available for purchase at the ANSI web site at <http://web.ansi.org/default.htm>.

“Caution zone jobs” - Jobs where an employee’s typical work activities include any of the specific physical risk factors identified in WAC 296-62-05105. These jobs have a sufficient degree of risk to require ergonomics awareness education and job hazard analysis.

Department of Energy ErgoEASER - Ergonomics Education, Awareness, System Evaluation and Recording (ErgoEASER) software package. U. S. Department of Energy, Office of Environment, Safety, and Health (1995). Can be downloaded from the Department of Energy web site at <http://tis.eh.doe.gov/others/ergoeaser/download.htm>.

Ergonomics – The science and practice of designing jobs or workplaces to match the capabilities and limitations of the human body.

Full Time Equivalent (FTE) – The equivalent of one person working full-time for one year (2,000 worker hours per year). For example, two persons working half time count as one FTE.

WAC 296-62-05150 (Cont.)

High Hand-Arm Vibration Levels - Tools with vibration values equal to or greater than 10 meters per second squared (m/s^2) eight-hour equivalent. Examples include some impact wrenches, carpet strippers, chain saws, and percussive tools.

Intensive Keying – Keying with the hands or fingers in a rapid, steady motion with few opportunities for temporary work pauses.

Job Strain Index - The Strain Index: A proposed method to analyze jobs for risk of distal upper extremity disorders, Moore, J.S., and A. Garg, (1995). Published in American Industrial Hygiene Association Journal, volume 56, pages 443-458. Web site at <http://sg-www.satx.disa.mil/hscoemo/tools/strain.htm>.

Moderate Hand-Arm Vibration Levels – Tools with vibration values between 2.5 and 10 meters per second squared (m/s^2) eight-hour equivalent. Examples include some grinders, sanders, and jig saws.

NIOSH Lifting Equation, 1991 – Waters, T.R., Putz-Anderson, V., Garg, A., and Fine, L.J. (1993). Revised NIOSH equation for the design and evaluation of manual lifting tasks. Published in Ergonomics, volume 36 (7), pages 749-776. For a manual on using the lifting equation see: Applications Manual for Revised Lifting Equation, Waters, T., Putz-Anderson, V., Garg, A. (1994). Available from the National Technical Information Center (NTIS), Springfield, VA 22161. 1-800-553-6847.

Calculator web site at <http://www.industrialhygiene.com/calc/lift.html>.

Application guideline web site at <http://www.cdc.gov/niosh/94-110.html>.

Rapid Entire Body Assessment tool (REBA) - Hignett, S. and McAtamney, L. (2000) Rapid entire body assessment (REBA). Published in Applied Ergonomics volume 31, pages 201-205.

Recovery Time – Work periods with light task demands, or rest breaks, that permit an employee to recover from physically demanding work.

The Rapid Upper Limb Assessment (RULA) - McAtamney, L. and Corlett, E.N. (1993) RULA: A survey method for the investigation of work-related upper limb disorders. Published in Applied Ergonomics, volume 24 (2), pages 91-99.

UAW-GM Risk Factor Checklists - UAW-GM Risk Factor Checklist 2, 1998. UAW-GM (United Auto Workers-General Motors), Center for Human Resources, Health and Safety Center, 1030 Doris Road, Auburn Hills, Michigan.

Work Activities – The physical demands, exertions, or functions of the job or task.

Work-Related Musculoskeletal Disorders (WMSDs) – Work-related disorders that involve soft tissues such as muscles, tendons, ligaments, joints, blood vessels and nerves. Examples include: Muscle strains and tears, ligament sprains, joint and tendon inflammation, pinched nerves, degeneration of spinal discs, carpal tunnel syndrome, tendinitis, rotator cuff syndrome. For purposes of this rule WMSDs do not include injuries from slips, trips, falls, motor vehicle accidents or being struck by or caught in objects.

PART 3

WAC 296-62-05160 When must employers comply with this rule?

Employers covered by this rule must comply with its requirements by the dates shown.

INITIAL IMPLEMENTATION SCHEDULE		
Employer	Awareness Education Completed And Hazard Analysis Completed	Hazard Reduction Completed
<ul style="list-style-type: none"> All employers in SIC codes* 078, 152, 174, 175, 176, 177, 242, 421, 451, 541, 805, and 836 who employ 50 or more annual full time equivalents (FTEs) in Washington state The Washington State Department of Labor & Industries 	July 1, 2002	July 1, 2003
<ul style="list-style-type: none"> The remaining employers in SIC codes* 078, 152, 174, 175, 176, 177, 242, 421, 451, 541, 805 and 836 All other employers who employ 50 or more annual full time equivalents (FTEs) in Washington state 	July 1, 2003	July 1, 2004
All other employers employing 11-49 annual full time equivalents (FTEs) in Washington state	July 1, 2004	July 1, 2005
All other employers employing 10 or fewer annual full time equivalents (FTEs) in Washington state	July 1, 2005	July 1, 2006
SUPPLEMENTAL IMPLEMENTATION SCHEDULE		
New workplaces or businesses	One year from the date the new workplace or business is established OR According to the schedule above	15 months from the date the new workplace or business is established OR According to the schedule above
Significant changes to existing workplaces or businesses	2 months after significant changes occur OR According to the schedule above	3 months after significant changes occur OR According to the schedule above

**Note: SIC code is the employer's primary SIC based on hours of employment. See Appendix C of this rule for descriptions of these SIC codes.*

Note: Help for employers in implementing the rule.

(1) Developing Ergonomics Guides and Models

The department will work with employer and employee organizations to develop guides for complying with this rule (for example, a model program for ergonomics awareness education). Employer use of these guides will be optional.

(2) Identifying Industry “Best Practices”

The department will work with employer and employee organizations to develop or identify methods of reducing WMSD hazards that will serve as examples of industry-specific “best practices.” As industry-specific “best practices” are developed, they may be used to demonstrate employer compliance with the requirement to reduce WMSD hazards. Employers will not be restricted to the use of industry “best practices” for compliance.

(3) Establishing Inspection Policies and Procedures

The department will develop policies and procedures for inspections and enforcement of this rule before the rule is enforced. These policies and procedures will be communicated to employers and employees through mailing lists, business associations, labor unions and other methods before the department issues any citations or penalties.

(4) Conducting Demonstration Projects

Following adoption of this rule, the department will work with employers and employees to undertake demonstration projects to test and improve guidelines, “best practices” and inspection policies and procedures as they are developed.

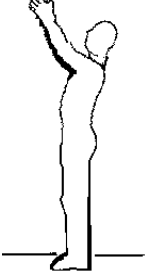
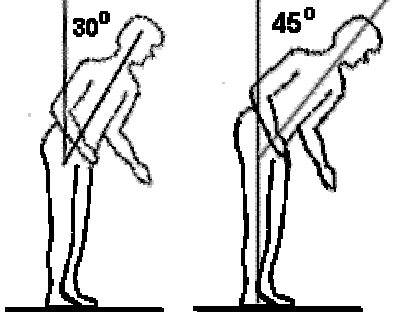
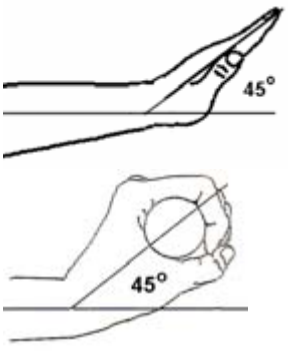
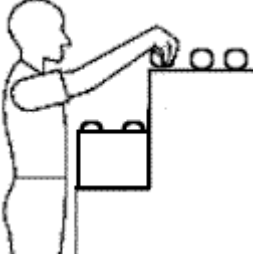

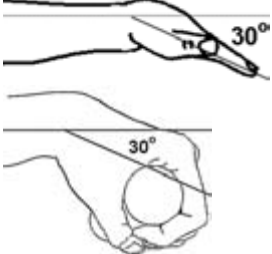
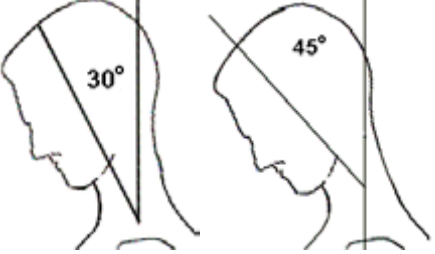

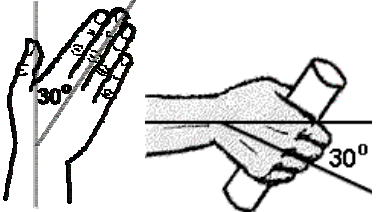
(5) Providing Information on Ergonomics

The department will work with employer and employee organizations to collect and share the most effective examples of ergonomics training, job analysis, and specific solutions to problems. The department will make special efforts to share this information with the small business community.


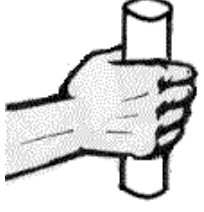
WAC 296-62-05172 Appendix A: Illustrations of physical risk factors

The following illustrations are provided as reference only. Some users of this rule may find the pictures aid their understanding of the text in WAC 296-62-05105.



Awkward Postures

Raising the hands above the head 	Bending the back 	Bending the wrist Extension 
Raising the elbows above the shoulders 	Squatting 	Flexion 
Bending the neck 	Kneeling 	Ulnar deviation (bent towards the little finger) 

High Hand Force

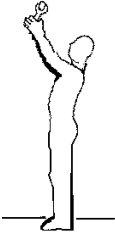
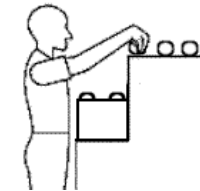
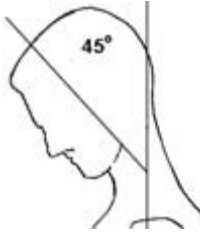

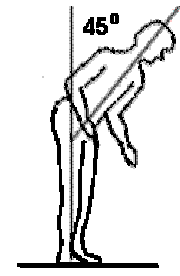
Pinching 2 lbs. 	Gripping 10 lbs. 
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Repeated Impacts



Using the knee as a hammer 	Using the hand as a hammer 
---	--

WAC 296-62-05714 Appendix B: Criteria for analyzing and reducing WMSD hazards for employers who choose the Specific Performance Approach.

For each "caution zone job" find any physical risk factors that apply. Reading across the page, determine if all of the conditions are present in the work activities. If they are, a WMSD hazard exists and must be reduced below the hazard level or to the degree technologically and economically feasible (see WAC 296-62-05130(4), specific performance approach).

Awkward Posture				Check (✓) here if this is a WMSD hazard
Body Part	Physical Risk Factor	Duration	Visual Aid	
Shoulders	Working with the hand(s) above the head or the elbow(s) above the shoulder(s)	More than 4 hours total per day		<input type="checkbox"/>
	Repetitively raising the hand(s) above the head or the elbow(s) above the shoulder(s) more than once per minute	More than 4 hours total per day		<input type="checkbox"/>
Neck	Working with the neck, bent more than 45° (without support, or the ability to vary posture)	More than 4 hours total per day		<input type="checkbox"/>
Back	Working with the back bent forward more than 30° (without support, or the ability to vary posture)	More than 4 hours total per day		<input type="checkbox"/>
	Working with the back bent forward more than 45° (without support, or the ability to vary posture)	More than 2 hours total per day		<input type="checkbox"/>

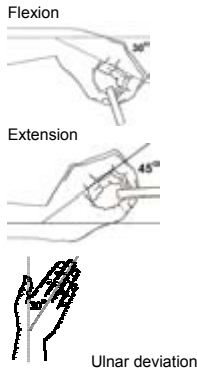

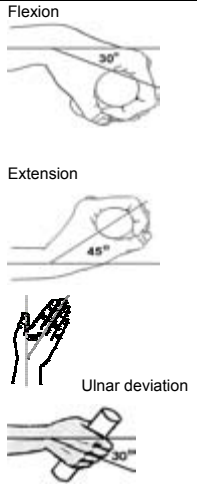
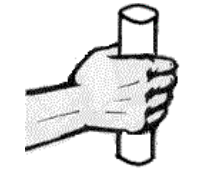
WAC 296-62-05174 (Cont.)

Awkward Posture (continued)			
Body Part	Physical Risk Factor	Duration	Visual Aid
Knees	Squatting	More than 4 hours total per day	
	Kneeling	More than 4 hours total per day	

Check (✓)
here if this is
a WMSD
hazard

☐
☐

WAC 296-62-05174 (Cont.)

High Hand Force				
Body Part	Physical Risk Factor	Combined with	Duration	Visual Aid
Arms, wrists, hands	Pinching an unsupported object(s) weighing 2 or more pounds per hand, or pinching with a force of 4 or more pounds per hand (comparable to pinching half a ream of paper)	Highly repetitive motion	More than 3 hours total per day	
		Wrists bent in flexion 30° or more, or in extension 45° or more, or in ulnar deviation 30° or more	More than 3 hours total per day	
		No other risk factors	More than 4 hours total per day	
Arms, wrists, hands	Gripping an unsupported object(s) weighing 10 or more pounds per hand, or gripping with a force of 10 pounds or more per hand (comparable to clamping light duty automotive jumper cables onto a battery)	Highly repetitive motion	More than 3 hours total per day	
		Wrists bent in flexion 30° or more, or in extension 45° or more, or in ulnar deviation 30° or more	More than 3 hours total per day	
		No other risk factors	More than 4 hours total per day	

Check (✓) here if this is a WMSD hazard



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WAC 296-62-05174 (Cont.)

Highly Repetitive Motion			
Body Part	Physical Risk Factor	Combined with	Duration
Neck, shoulders, elbows, wrists, hands	Using the same motion with little or no variation every few seconds (excluding keying activities)	No other risk factors	More than 6 hours total per day
	Using the same motion with little or no variation every few seconds (excluding keying activities)	Wrists bent in flexion 30° or more, or in extension 45° or more, or in ulnar deviation 30° or more AND High, forceful exertions with the hand(s)	More than 2 hours total per day
	Intensive keying	Awkward posture, including wrists bent in flexion 30° or more, or in extension 45° or more, or in ulnar deviation 30° or more	More than 4 hours total per day
		No other risk factors	More than 7 hours total per day

Check (✓) here if this is a WMSD hazard

☐
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Repeated Impact			
Body Part	Physical Risk Factor	Duration	Visual Aid
Hands	Using the hand (heel/base of palm) as a hammer more than once per minute	More than 2 hours total per day	
Knees	Using the knee as a hammer more than once per minute	More than 2 hours total per day	

Check (✓) here if this is a WMSD hazard

☐
☐

WAC 296-62-05174 (Cont.) Heavy, Frequent or Awkward Lifting

This analysis only pertains if you have "caution zone jobs" where employees lift 10 lbs. or more (see WAC 296-62-05105, Heavy, Frequent, or Awkward lifting) and you have chosen the specific performance approach.

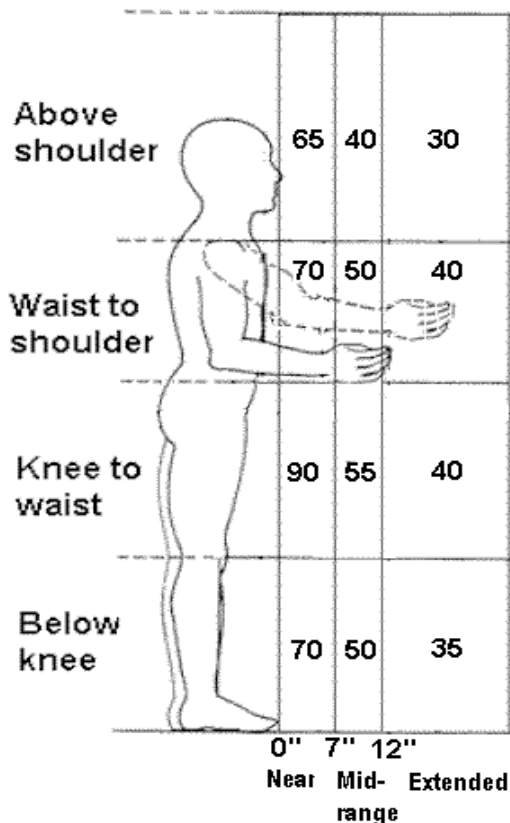
Step 1

Find out the actual weight of objects that the employee lifts.

Actual Weight = _____ lbs.

Step 2

Determine the Unadjusted Weight Limit. Where are the employee's hands when they begin to lift or lower the object? Mark that spot on the diagram below. The number in that box is the Unadjusted Weight Limit in pounds.



Step 3

Find the Limit Reduction Modifier. Find out how many times the employee lifts per minute and the total number of hours per day spent lifting. Use this information to look up the Limit Reduction Modifier in the table below.

How many lifts per minute?	For how many hours per day?		
	1 hr or less	1 hr to 2 hrs	2 hrs or more
1 lift every 2-5 min	1.0	0.95	0.85
1 lift every min	0.95	0.9	0.75
2-3 lifts every min	0.9	0.85	0.65
4-5 lifts every min	0.85	0.7	0.45
6-7 lifts every min	0.75	0.5	0.25
8-9 lifts every min	0.6	0.35	0.15
10+ lifts every min	0.3	0.2	0.0

Note: For lifting done less than once every five minutes, use 1.0

Limit Reduction Modifier: = _____

Calculate the Weight Limit. Start by copying the Unadjusted Weight Limit from Step 2.

Step 4

Unadjusted Weight Limit: = _____ lbs.

If the employee twists more than 45 degrees while lifting, reduce the Unadjusted Weight Limit by multiplying by 0.85. Otherwise, use the Unadjusted Weight Limit.

Twisting Adjustment: = _____

Adjusted Weight Limit: = _____ lbs.

Multiply the Adjusted Weight Limit by the Limit Reduction Modifier from Step 3 to get the Weight Limit. **X**

Limit Reduction Modifier: = _____

Step 5

Weight Limit: = _____ lbs.

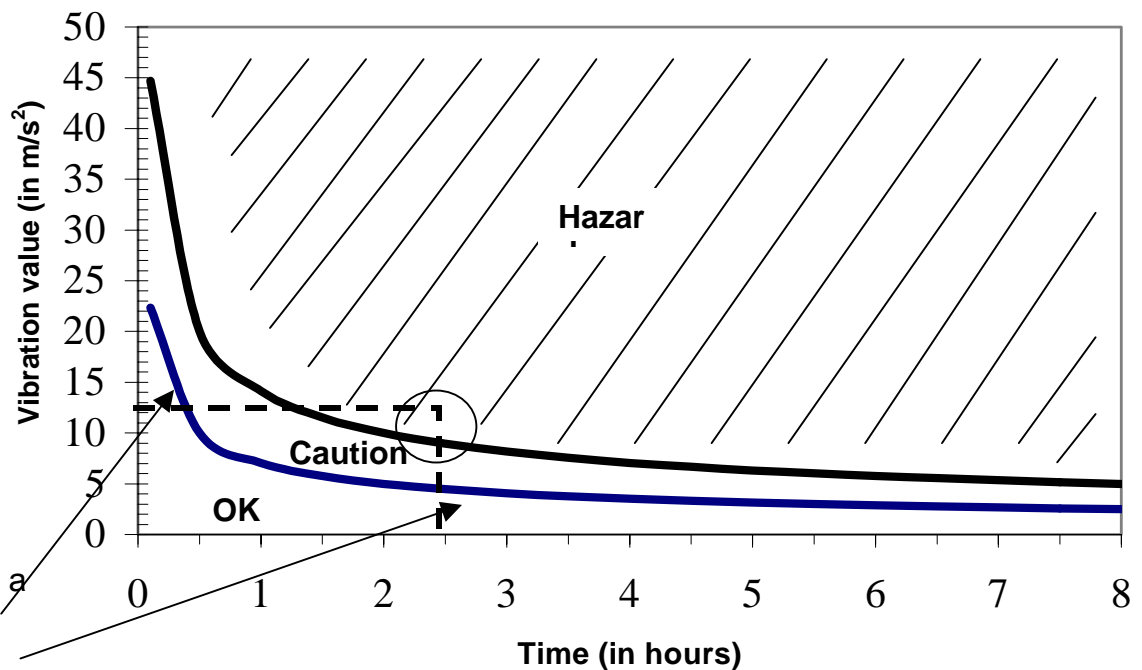
Is this a hazard? Compare the Weight Limit calculated in Step 4 with the Actual Weight lifted from Step 1. If the Actual Weight lifted is greater than the Weight Limit calculated, then the lifting is a WMSD hazard and must be reduced below the hazard level or to the degree technologically and economically feasible.

Note: If the job involves lifts of objects with a number of different weights and/or from a number of different locations, use Steps 1 through 5 above to:

1. Analyze the two worst case lifts -- the heaviest object lifted and the lift done in the most awkward posture.
2. Analyze the most commonly performed lift. In Step 3, use the frequency and duration for all of the lifting done in a typical day.

Use the instructions below to determine if a hand-arm vibration hazard exists.

- Step 1. Find the vibration value for the tool. (Get it from the manufacturer, look it up at this website: <http://umetech.niwl.se/vibration/HAVHome.html>, or you may measure the vibration yourself). The vibration value will be in units of meters per second squared (m/s^2). On the graph below find the point on the left side that is equal to the vibration value. *Note: You can also link to this website through the L&I WISHA Services Ergonomics website: <http://www.lni.wa.gov/wisha/ergo>*
- Step 2. Find out how many total hours per day the employee is using the tool and find that point on the bottom of the graph.
- Step 3. Trace a line in from each of these two points until they cross.
- Step 4. If that point lies in the cross-hatched "Hazard" area above the upper curve, then the vibration hazard must be reduced below the hazard level or to the degree technologically and economically feasible. If the point lies between the two curves in the "Caution" area, then the job remains as a "Caution Zone Job." If it falls in the "OK" area below the bottom curve, then no further steps are required.



Example:

An impact wrench with a **Vibration value of 12 m/s^2** is used for **2½ hours** total per day. The exposure level is in the Hazard area. The vibration must be reduced below the hazard level or to the degree technologically and economically feasible.

Note: The caution limit curve (bottom) is based on an 8-hour energy-equivalent frequency-weighted acceleration value of 2.5 m/s^2 . The hazard limit curve (top) is based on an 8-hour energy-equivalent frequency-weighted acceleration value of 5 m/s^2 .

WAC 296-62-05176 Appendix C: Standard Industry Classification (SIC) codes.

The descriptive titles for the SIC codes listed in the implementation schedule (WAC 296-62-05160) are provided below. SIC codes are established by the federal Office of Management and Budget and are listed in the Standard Industrial Classification Manual, 1987 edition.

SIC*	INDUSTRY	EXAMPLES
078	Landscape and Horticultural Services	<ul style="list-style-type: none">• lawn and garden services• ornamental shrub and tree services
152	General Building Contractors, Residential Buildings	<ul style="list-style-type: none">• general contractors—single-family houses• general contractors—residential buildings other than single-family
174	Masonry, Stonework, Tile Setting & Plastering	<ul style="list-style-type: none">• masonry, stone setting, and other stone work• plastering, drywall, acoustical, and insulation work• terrazzo, tile, marble, and mosaic work
175	Carpentry and Floor Work	<ul style="list-style-type: none">• carpentry work• floor laying and other floor work (NEC**)
176	Roofing, Siding and Sheet Metal	<ul style="list-style-type: none">• installation of roofing, siding, and sheet metal work
177	Concrete Work	<ul style="list-style-type: none">• includes portland cement and asphalt
242	Sawmills & Planing Mills	<ul style="list-style-type: none">• sawmills and planing mills• hardwood dimension and flooring mills• special products sawmills (NEC**)
421	Trucking & Courier Service, not air	<ul style="list-style-type: none">• trucking• local trucking with or without storage• courier services (except by air)
451	Air Transportation, Scheduled and Air Courier	<ul style="list-style-type: none">• scheduled air transportation• air courier services <p>Note: WISHA jurisdiction excludes planes in flight.</p>
541	Grocery Stores	<ul style="list-style-type: none">• supermarkets• food stores• grocery stores
805	Nursing & Personal Care	<ul style="list-style-type: none">• skilled nursing care facilities• intermediate care facilities• nursing and personal care facilities, (NEC**)
836	Residential Care	<ul style="list-style-type: none">• establishments primarily engaged in the provision of residential social and personal care for children, the aged, and special categories of persons with some limits on ability for self-care, but where medical care is not a major element.

*SIC or NAICS equivalent. In 2000, federal agencies that produce statistical data will adopt NAICS (North American Industry Classification System) codes and begin to phase out the SIC codes. State and local government agencies also will use this new coding structure to promote a common language for categorizing today's industries.

**NEC – not elsewhere classified.

Complying with Washington's Ergonomics Rule: L&I's Caution Zone Job Checklist

*This rule does not apply to you **IF** you don't find any Caution Zone Jobs*

- [Checklist Page 1](#)
Awkward Postures and High Hand Force
- [Checklist Page 2](#)
Highly Repetitive Motions, Repeated Impacts, Heavy,
Frequent and Awkward Lifting, and Moderate to High Hand-
Arm Vibration



Caution Zone Checklist (WAC 296-62-05105)

Use one sheet for each position evaluated.

Movements or postures that are a regular and foreseeable part of the job, occurring more than *one day per week*, and more frequently than *one week per year*.

If done in
this job
position
☒ the box

Job Position evaluated:

No. of
employees in
these jobs?

Date:

Awkward Posture

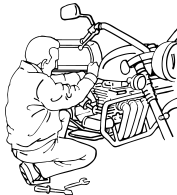
Comments/Observations



1. Working with the hand(s) above the head, or the elbow(s) above the shoulders more than **2 hours** total per day.

☐


2. Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than **2 hours** total per day.

☐


3. Squatting more than **2 hours** total per day.

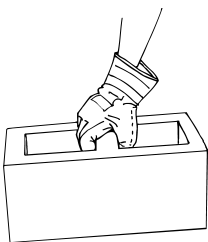
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4. Kneeling more than **2 hours** total per day.

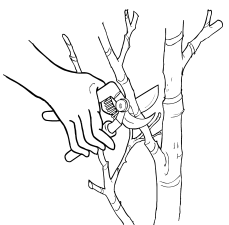
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High Hand Force

Comments/Observations



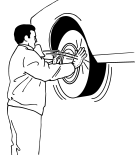



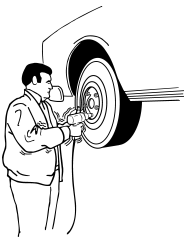
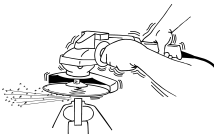


5. Pinching an unsupported object(s) weighing 2 or more pounds per hand, or pinching with a force of 4 or more pounds per hand, more than **2 hours** per day (comparable to pinching half a ream of paper).

☐


6. Gripping an unsupported object(s) weighing 10 or more pounds per hand, or gripping with a force of 10 or more pounds per hand, more than **2 hours** total per day (comparable to clamping light duty automotive jumper cables onto a battery).

☐

Highly Repetitive Motion		Comments/Observations
 <p>7. Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds, more than 2 hours total per day.</p>	<input type="checkbox"/>	
 <p>8. Performing intensive keying more than 4 hours total per day.</p>	<input type="checkbox"/>	
Repeated Impact		Comments/Observations
 <p>9. Using the <i>hand</i> (heel/base of palm) or <i>knee</i> as a hammer more than 10 times per hour, more than 2 hours total per day.</p>	<input type="checkbox"/>	
Heavy, Frequent or Awkward Lifting (A simple scale can be used to determine the weight of materials)		Comments/Observations
 <p>10. Lifting object weighing more than 75 pounds once per day or more than 55 pounds more than 10 times per day.</p>	<input type="checkbox"/>	
 <p>11. Lifting objects weighing more than 10 pounds if done more than twice per minute, more than 2 hours total per day.</p>	<input type="checkbox"/>	
 <p>12. Lifting objects weighing more than 25 pounds above the shoulders, below the knees or at arms length more than 25 times per day.</p>	<input type="checkbox"/>	
Moderate to High Hand- Arm Vibration (Closely estimate or obtain the vibration value of the tool in use)		Comments/Observations
 <p>13. Using impact wrenches, carpet strippers, chain saws, percussive tools (jack hammers, scalers, riveting or chipping hammers) or other tools that typically have high vibration levels, more than 30 minutes total per day.</p>	<input type="checkbox"/>	
 <p>14. Using grinders, sanders, jig saws or other hand tools that typically have moderate vibration levels more than 2 hours total per day.</p>	<input type="checkbox"/>	


Complying with Washington's Ergonomics Rule: L&I's Hazard Zone Job Checklist

- [Checklist Page 1](#)
Awkward Postures
- [Checklist Page 2](#)
High Hand Force
- [Checklist Page 3](#)
Highly Repetitive Motion and Repeated Impacts
- [Checklist Page 4](#)
Calculator for Analyzing Lifting Operations
- [Checklist Page 5](#)
Calculator for Hand – Arm Vibration







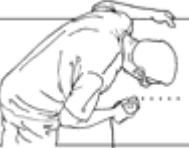


HAZARD ZONE CHECKLIST (APPENDIX B) - WAC 296-62-05174



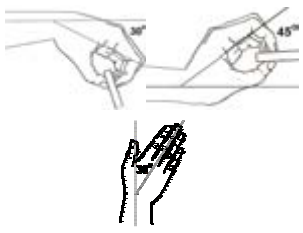
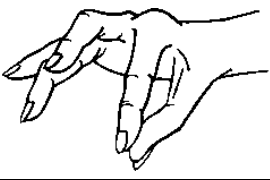

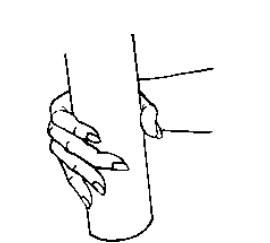
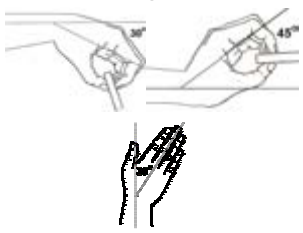
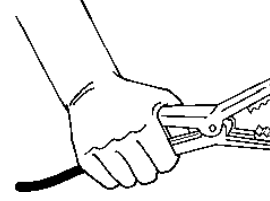
For each "caution zone job" find any physical risk factors that apply. If a hazard exists, it must be reduced below the hazard level or to the degree technologically and economically feasible.

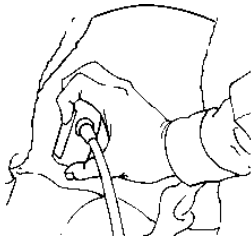
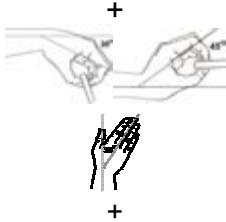


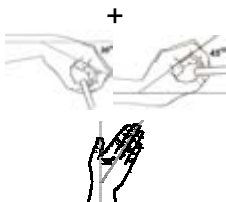

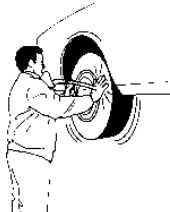
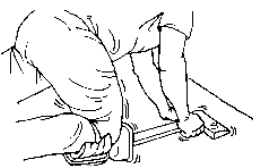
Movements or postures that are a regular and foreseeable part of the job, occurring more than <i>one day per week</i>, and more frequently than <i>one week per year</i>.	Hazard Exists 	Job Position evaluated: Date:	No. of employees in these jobs?
--	--	--------------------------------------	--

Awkward Posture

Comments/Observations

	1. Working with the hand(s) above the head, or the elbows above the shoulders	More than 4 hours total per day	<input type="checkbox"/>	
	2. Repeatedly raising the hand(s) above the head, or the elbow(s) above the shoulder(s) more than once per minute	More than 4 hours total per day	<input type="checkbox"/>	
	3. Working with the neck bent more than 45° (without support or the ability to vary posture)	More than 4 hours total per day	<input type="checkbox"/>	
	4. Working with the back bent forward more than 30° (without support or the ability to vary posture)	More than 4 hours total per day	<input type="checkbox"/>	
	5. Working with the back bent forward more than 45° (without support or the ability to vary posture)	More than 2 hours total per day	<input type="checkbox"/>	
	6. Squatting	More than 4 hours total per day	<input type="checkbox"/>	
	7. Kneeling	More than 4 hours total per day	<input type="checkbox"/>	

High Hand Force		Hazard Exists ✓	Comments/Observations
Pinching an unsupported object(s) weighing 2 lbs or more per hand, or pinching with a force of 4 lbs or more per hand (comparable to pinching a half a ream of paper)			
8. 	+ Highly repetitive motion	+ More than 3 hours total per day	<input type="checkbox"/>
9. 	+ 	+ More than 3 hours total per day	<input type="checkbox"/>
10. 	No other risk factors	+ More than 4 hours total per day	<input type="checkbox"/>
Gripping an unsupported object(s) weighing 10 lbs or more per hand, or gripping with a force of 10 lbs or more per hand (comparable to clamping light duty automotive jumper cables onto a battery)			
11. 	+ Highly Repetitive motion	+ More than 3 hours total per day	<input type="checkbox"/>
12. 	+ 	+ More than 3 hours total per day	<input type="checkbox"/>
13. 	No other risk factors	+ More than 4 hours total per day	<input type="checkbox"/>

Highly Repetitive Motion			Hazard Exists ✓	Comments/ Observations
Using the same motion with little or no variation every few seconds (excluding keying activities)				
14.	  High, forceful exertions with the hand(s)	+ More than 2 hours <i>total</i> per day	<input type="checkbox"/>	
15.	 No other risk factors	+ More than 6 hours <i>total</i> per day	<input type="checkbox"/>	
Intensive keying				
16.	 	+ More than 4 hours <i>total</i> per day	<input type="checkbox"/>	
17.	 No other risk factors	+ More than 7 hours <i>total</i> per day	<input type="checkbox"/>	
Repeated Impact				Comments/ Observations
18.	 Using the hand (heel/base of palm) as a hammer more than once per minute	+ More than 2 hours <i>total</i> per day	<input type="checkbox"/>	
19.	 Using the knee as a hammer more than once per minute	+ More than 2 hours <i>total</i> per day	<input type="checkbox"/>	

Appendix B: Calculator for analyzing lifting operations

Company

Job

Evaluator

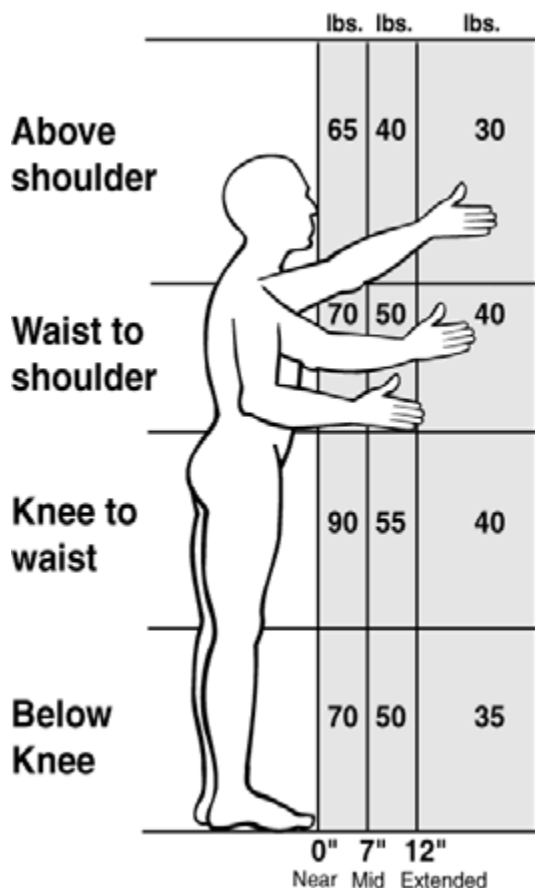
Date

- 1** Enter the weight of the object lifted.

Weight Lifted

Lb.

- 2** Circle the number on a rectangle below that corresponds to the position of the person's hands when they begin to lift or lower the objects.



- 3** Circle the number that corresponds to the times the person lifts per minute and the total number of hours per day spent lifting.

Note: For lifting done less than once every five minutes, use 1.0

How many lifts per minute?	How many hours per day?		
	1 hr or less	1 hr to 2 hrs	2 hrs or more
1 lift every 2-5 min	1.0	0.95	0.85
1 lift every min	0.95	0.9	0.75
2-3 lifts every min	0.9	0.85	0.65
4-5 lifts every min	0.85	0.7	0.45
6-7 lifts every min	0.75	0.5	0.25
8-9 lifts every min	0.6	0.35	0.15
10+ lifts every min	0.3	0.2	0.0

- 4** Circle 0.85 if the person twists 45 degrees or more while lifting.

0.85

Otherwise circle 1.0

- 5** Copy below the numbers you have circled in steps 2, 3, and 4.

lb.	X		X		=	Lifting Limit
Step 2		Step 3		Step 4		lb.

- 6** Is the Weight Lifted (1) less than the lifting Limit (5)?

Yes – OK
No – HAZARD
 See back for solution ideas.

Department of
**LABOR AND
 INDUSTRIES**



Appendix B: Calculator for Hand-Arm Vibration

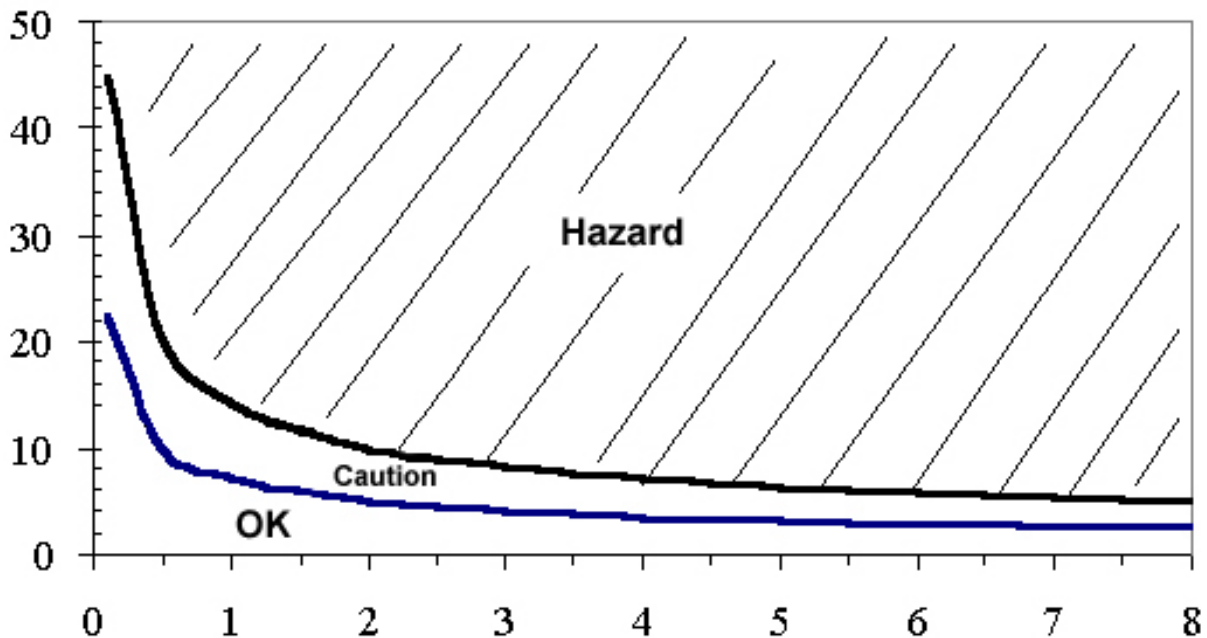
- Find the vibration value for the tool. (Get it from the manufacturer look it up at this website <http://umetech.niwl.se/Vibration/action.lasso?-database=HAVbase.fp3&-layout=Normal&-response=HAVSearch.html&-show> On the graph below mark the point on the left side shown as Vibration value.

Vibration
m/s ²

- Find out how many total hours per day the employee is using the tool and mark that point on the bottom of the chart below.

Duration
Hrs.

- Trace a line into the graph from each of these two points until they cross.



4. Interpretation

- If that point lies in the crosshatched "Hazard" area above the upper curve, then the vibration hazard must be reduced below the hazard level or to the degree technologically and economically feasible.
- If the point lies between the two curves in the "Caution" area, then the job remains as a "Caution Zone Job."
- If the point falls in the "OK" area below the bottom curve, then no further steps are required.

Note: The caution limit curve (bottom) is based on an 8-hour energy-equivalent frequency- weighted acceleration value of 2.5 m/s². The hazard limit curve (top) is based on an 8-hour energy-equivalent frequency- weighted acceleration value of 5 m/s².



Ergonomics Awareness Education

For Employees in Caution Zone Jobs and Their Supervisors

Neutral Posture

A good posture is one that places the least amount of stress on your joints and muscles, allowing them to work more efficiently. This is referred to as neutral posture.

Whether you are standing or sitting, you should try to work in a neutral posture as much as possible. Here are some guidelines:

- Keep all the parts of your body aligned – ears directly over shoulders, shoulders over hips, hips over knees, knees over ankles.
- Look straight ahead with your head level, not twisted or bent.
- Relax your shoulders; don't hunch them or rotate them forward.
- Let your upper arms and elbows lie comfortably at your sides.
- Keep your wrists straight and in a handshake position.
- Stand with your legs straight, but with your knees relaxed, not locked back.



Seated neutral posture is the same as standing, with two more things to keep in mind:

- Support your low back using the chair's backrest.
- Support your feet by placing them flat on the floor or on a footrest, with your knees slightly lower than your hips.

While neutral posture places the least stress on your body, it wouldn't be good for you to stay in that position all day. Your body was designed to move around and is much happier when it is active.



Table 10 Core Ergonomic Control Methods – Examples

Hazard	Ergonomic Control Methods
--------	---------------------------

Table 10 Core Ergonomic Control Methods - Examples

Hazard	Ergonomic Control Methods
AWKWARD POSTURES	
Working with hand(s) above the head or the elbow(s) above the shoulder(s), more than 4 hours total per day	<ul style="list-style-type: none"> • Raise the worker up with elevated work platforms or ladders. • Make tools longer with articulating arms or extension handles. • Bring the work down and tilt it on its side for better access • Provide adjustability where possible for multiple users • Design reach distance for the shortest worker • Provide arm supports • Use sloping platforms with overhead conveyers to adjust for variable worker heights
Repetitively raising the hand(s) above the head or the elbow(s) above the shoulder(s) more than once per minute, more than 4 hours total per day	<ul style="list-style-type: none"> • Limit overhead storage to infrequently used items. • Raise the worker up with elevated work platforms or ladders. • Make tools longer with articulating arms or extension handles. • Bring the work down and tilt it on its side for better access. • Provide adjustability where possible for multiple users • Design reach distance for the shortest worker
Working with the neck bent more than 45°(without support or the ability to vary posture), more than 4 hours total per day	<ul style="list-style-type: none"> • Raise and tilt objects being viewed to keep neck more upright. • Use magnifiers when working on objects with the hands in order to keep the arms and shoulders down. • Support the head with a chin/forehead cradle. • Use monitor arms or stackers to raise up monitors • Use video or mirror systems to view objects or locations that are difficult to see (dental/medical/surgical tasks, fork trucks)

Table 10 Core Ergonomic Control Methods – Examples

Hazard	Ergonomic Control Methods
Working with the back bent forward (without support or the ability to vary posture) more than 30 degrees for more than 4 hours per day, or more than 45° for more than 2 hours per day	<ul style="list-style-type: none"> • Raise and tilt the work to provide better access. • Use a sit/stand stool to lower the worker. • Make tools longer with articulating arms or extension handles. • Alternate between bending, sitting, kneeling and squatting. • Use a chest pad to support the weight of the upper body. • Locate objects well within arms' reach • Use body carts for ground level work
Squatting more than 4 hours total per day	<ul style="list-style-type: none"> • Raise the work to provide better access. • Make tools longer with articulating arms or extension handles. • Alternate between bending, sitting, kneeling and squatting. • Use body carts for ground level work • Use short portable stools for ground level work
Kneeling more than 4 hours total per day	<ul style="list-style-type: none"> • Wear knee pads. • Raise the work to provide better access. • Make tools longer with articulating arms or extension handles. • Alternate between bending, sitting, kneeling and squatting.

Table 10 Core Ergonomic Control Methods – Examples

Hazard	Ergonomic Control Methods
HIGH HAND FORCE	
Pinching an unsupported object(s) weighing 2 or more lbs. per hand or pinching with a force of 4 or more pounds per hand, combined with highly repetitive motions for more than 3 hours total per day	<ul style="list-style-type: none"> • Redesign hand-tool interface for use of a power grip. • Reduce weight of tool or object. • Use clamps or vices to eliminate forceful pressing or pinches • Use fasteners requiring minimal pinch force (e.g. plastic rather than metal) • Use fasteners that can be inserted by tool
Pinching an unsupported object(s) weighing 2 or more lbs. per hand or pinching with a force of 4 or more pounds per hand, combined with wrists bent in flexion 30° or more or in extension 45° or more for more than 3 hours total per day	<ul style="list-style-type: none"> • Redesign hand-tool interface for use of a power grip. • Reduce hand-object interface to reduce slipperiness • Reduce weight of tool or object. • Change tool, work surface orientation, or worker location to reduce bent wrist postures.
Pinching an unsupported object(s) weighing 2 or more lbs. per hand or pinching with a force of 4 or more pounds per hand for more than 4 hours total per day	<ul style="list-style-type: none"> • Redesign hand-tool interface for use of a power grip. • Reduce weight of tool or object. • Rotate jobs between workers. • Use clamps or vices to eliminate forceful pressing or pinches • Use fasteners requiring minimal pinch force (e.g. plastic rather than metal) • Use fasteners that can be inserted by tool
Gripping an unsupported object(s) weighing 10 or more lbs. per hand or gripping with a force of 10 or more pounds per hand, combined with highly repetitive motions for more than 3 hours total per day	<ul style="list-style-type: none"> • Reduce weight of tool or object. • Use balancers, adjustable fixtures, articulating arms to hold handled items or minimize weight held in the hand • Use two hands rather than one • Alternate between hands • Sharpen cutting tools to reduce force requirements during use • Rotate between tasks

Table 10 Core Ergonomic Control Methods – Examples

Hazard	Ergonomic Control Methods
<p>Gripping an unsupported object(s) weighing 10 or more lbs. per hand or gripping with a force of 10 or more pounds per hand, combined with wrists bent in flexion 30° or more or in extension 45° or more or in ulnar deviation 30° or more for more than 3 hours total per day</p>	<ul style="list-style-type: none"> • Reduce weight of tool or object. • Change tool, work surface orientation, or worker location to reduce bent wrist postures. • Use balancers, adjustable fixtures, articulating arms to hold handled items or minimize weight held in the hand • Use two hands rather than one • Alternate between hands • Sharpen cutting tools to reduce force requirements during use
<p>Gripping an unsupported object(s) weighing 10 or more lbs. per hand or gripping with a force of 10 or more pounds per hand, more than 4 hours total per day</p>	<ul style="list-style-type: none"> • Reduce weight of tool or object. • Rotate jobs between workers. • Use balancers, adjustable fixtures, articulating arms to hold handled items or minimize weight held in the hand • Use two hands rather than one • Alternate between hands • Sharpen cutting tools to reduce force requirements during use • Preventive maintenance of tools to reduce high hand forces • Use bench mounted adapters to provide more leverage

Table 10 Core Ergonomic Control Methods – Examples

Hazard	Ergonomic Control Methods
HIGHLY REPETITIVE MOTIONS	
Using the same motion with little or no variation every few seconds (excluding keying activities) more than 6 hours total per day	<ul style="list-style-type: none"> • Rotate jobs with other workers, varying the types of motion • Use job enlargement, increase the number of tasks performed by the worker, varying the types of movement • Reduced the speed of the motions if possible • Use mechanical assists • Use multifunction tools
Using the same motion with little or no variation every few seconds (excluding keying activities) combined with wrists bent in flexion 30° or more or in extension 45° or more or in ulnar deviation 30° or more, and high, forceful exertions with the hand(s), more than 2 hours total per day	<ul style="list-style-type: none"> • Re-orient or move objects into positions where bent wrists are eliminated • Rotate jobs with other workers, varying the types of motion • Use tools (with power grip) if exertions are required • Provide jig/vice to hold parts reducing forceful grasping and allowing the use of two hands • Use mechanical assists • Use multifunction tools
Intensive keying for more than 7 hours total per day, or combined with awkward postures for more than 4 hours total per day	<ul style="list-style-type: none"> • Enlarge the job to include tasks other than keying • Provide equipment to reduce awkward postures such as wrist rests, arm rests, adjustable keyboard shelves • Rearrange workstation to eliminate awkward postures e.g. raise monitor, lower keyboard, bring mouse closer to keyboard • Utilize voice-recognition software • Utilize software macros that automate repetitive keystrokes • Schedule breaks

Table 10 Core Ergonomic Control Methods – Examples

Hazard	Ergonomic Control Methods
REPEATED IMPACT	
Using the hand (heel/base of palm) as a hammer more than once per minute more than 2 hours total per day	<ul style="list-style-type: none"> • Use rubber mallets, bean bags, or other padded tools to strike with instead of the palm. • Press objects into place using levers, or hydraulic or pneumatic tools. • Redesign assembly processes to avoid the need to pound parts in by hand. • Use viscoelastic padded palm pads to reduce impact • Cover sharp or hard objects with pads • Use different types of palm button guards such as light sensors for manual activation of equipment
Using the knee as a hammer more than once per minute more than 2 hours total per day	<ul style="list-style-type: none"> • Use tools that don't require knee kicks, such as power stretchers for carpet laying, or long handled mallets. • Press objects into place using levers, or hydraulic or pneumatic tools. • Relocate knee switches so that the thigh or the foot presses them. • Redesign processes to avoid the need to pound parts in by knee

Table 10 Core Ergonomic Control Methods – Examples

Hazard	Ergonomic Control Methods
HEAVY, FREQUENT or AWKWARD LIFTING	
Heavy lifting	<ul style="list-style-type: none"> • Reduce weight of load • Increase weight of load so that it requires mechanical assist • Reduce the capacity of the container • Use slides, gravity chutes to eliminate lifting • Use mechanical assist such as overhead hoist, manipulator, vacuum lift, pneumatic balancer, forklift • Use telescoping extendible conveyors with powered belts that reach deep into trailers • Reduce the horizontal distance of the load away from the body by reducing the size of the packaging • Reduce the horizontal distance of the load away from the body by removing barriers, obstacles that make access to the object difficult • Team lift the object with two or more workers • Improve layout of work process so the need to move materials is minimized • Provide handholds which increase lifting capability up to 15%
Frequent lifting	<ul style="list-style-type: none"> • Use mechanical assist such as overhead hoist, manipulator, vacuum lift, pneumatic balancer, forklift • Reorganize work method to eliminate repeated handling of the same object • Rotate workers to jobs with light or no manual handling • Use slides, gravity chutes to eliminate lifting • Use mobile storage racks to avoid unnecessary loading and unloading

Table 10 Core Ergonomic Control Methods – Examples

Hazard	Ergonomic Control Methods
Awkward lifting	<ul style="list-style-type: none"> • Redesign workstation layout to eliminate trunk twisting by locating objects within arm's reach • Design workstation with adjustable heights to eliminate bent forward posture when lifting • Eliminate the use of deep shelves that require a worker to bend and reach for objects. • Store objects at 30" off the floor • Provide sturdy walk-up ladder with handrails to access stored parts on high shelves/racks. • Provide rigid containers to better control the load

Table 10 Core Ergonomic Control Methods – Examples

Hazard	Ergonomic Control Methods
HAND-ARM VIBRATION	
Segmental vibration	<ul style="list-style-type: none"> • Select power tools with lower vibration emission levels • Provide regular maintenance to eliminate vibrations caused by imbalanced mechanical parts e.g. grinding wheels • Increased tool weight could reduce vibration transmitted to the hands, though cautions should be taken not to introduce other risk factors • Using balancers, isolators, damping materials, articulating arms, vertical suspension, and counter weighting to reduce grip requirements and provide an alternative transmission route for vibrational energy • Use battery operated rather than air powered tools where possible • Isolate vibration between source and hand by providing handles with a well designed mass-spring system or anti-vibration gloves • Tools should have a high power to weight ratio, have low torque with a cutoff rather than a slip-clutch mechanism and have handles with a non-slip surface to reduce the need to grip tightly. • Reduce vibration exposure duration
Note: This table provides examples of how the core ergonomics principles can be used to reduce exposure to musculoskeletal hazards. These examples are a selection from the rulemaking file.	

OPTIONAL

Ergonomics Awareness Education

For Employees in Caution Zone Jobs and Their Supervisors

Attendance Roster

Date: _____

[illegible]



Certificate of Achievement

Has Completed The Ergonomics Awareness Education Program
As Required by the Ergonomics Rule of the State of Washington

Date

Employer

Complying with Washington's Ergonomics Rule:

Ergonomics Awareness Education

Slideshow

Slideshow (use the "full screen" view from the View menu bar)

- [First slide: start show](#)
- [Definition of Ergonomics](#)
- [Benefits of Ergonomics](#)
- [Awkward postures](#)
- [High hand force](#)
- [Highly repetitive motions](#)
- [Repeated impacts](#)
- [Lifting](#)
- [Hand – arm vibration](#)
- [Why is it important to report symptoms early?](#)
- [Six key points to remember](#)



<http://www.lni.wa.gov/wisha>



Ergonomics Awareness Education

For employees in caution zone
jobs and their supervisors

By the end of this presentation you will be able to:

1. Define ergonomics and its benefits
2. List the requirements of the Washington State Ergonomics Rule
3. Identify work activities that can lead to injury
4. List examples of ergonomic principles that reduce risk of injury

By the end of this presentation you will be able to:

5. Participate in your company's ergonomic efforts
6. Identify parts of the body that get injured at work
7. Recognize and report signs and symptoms of injury early

WMSDs?

Work-related

Musculo

Skeletal

Disorders

Safety, health and the ergonomics rule

- Education on injury prevention is an important part of safety and health
- There are thousands of injuries, known as WMSDs, in Washington state every year
- Washington state has an ergonomics rule to help prevent these injuries

WAC 296-62-051, Ergonomics	
Part 1	
WAC	
296-62-05101	What is the purpose of this rule?
296-62-05103	Which employers are covered by this rule?
296-62-05105	What is a "caution zone job"?
Part 2	
WAC	
296-62-05110	When do employers' existing ergonomics activities comply with this rule?
296-62-05120	Which employees must receive ergonomics awareness education and when?
296-62-05122	What must be included in ergonomics awareness education?
296-62-05130	What options do employers have for analyzing and reducing WMSC hazards?
296-62-05140	How must employees be kept involved and informed?
296-62-05150	How are terms and phrases used in this rule?
Part 3	
WAC	
296-62-05160	When must employers comply with this rule?
Note	Help for employers in implementing the rule.
Appendices	
WAC	
296-62-05172	Appendix A: Illustrations of physical risk factors.
296-62-05174	Appendix B: Criteria for analyzing and reducing WMSC hazards for employers who choose the Specific Performance Approach.
296-62-05176	Appendix C: Standard Industry Classification (SIC) codes.

The Washington State Ergonomics Rule

Applies only to “caution zone jobs”

- Caution zone jobs may not need to be fixed
- Caution zone jobs must be analyzed to see if they reach the hazard zone level

The Washington State Ergonomics Rule

Prevents you from working in “**hazard zone jobs**”, because...

- Hazard zone jobs have greater exposure to risk factors than caution zone jobs
- Hazard zone jobs must then be fixed to reduce the exposure

The Washington State Ergonomics Rule

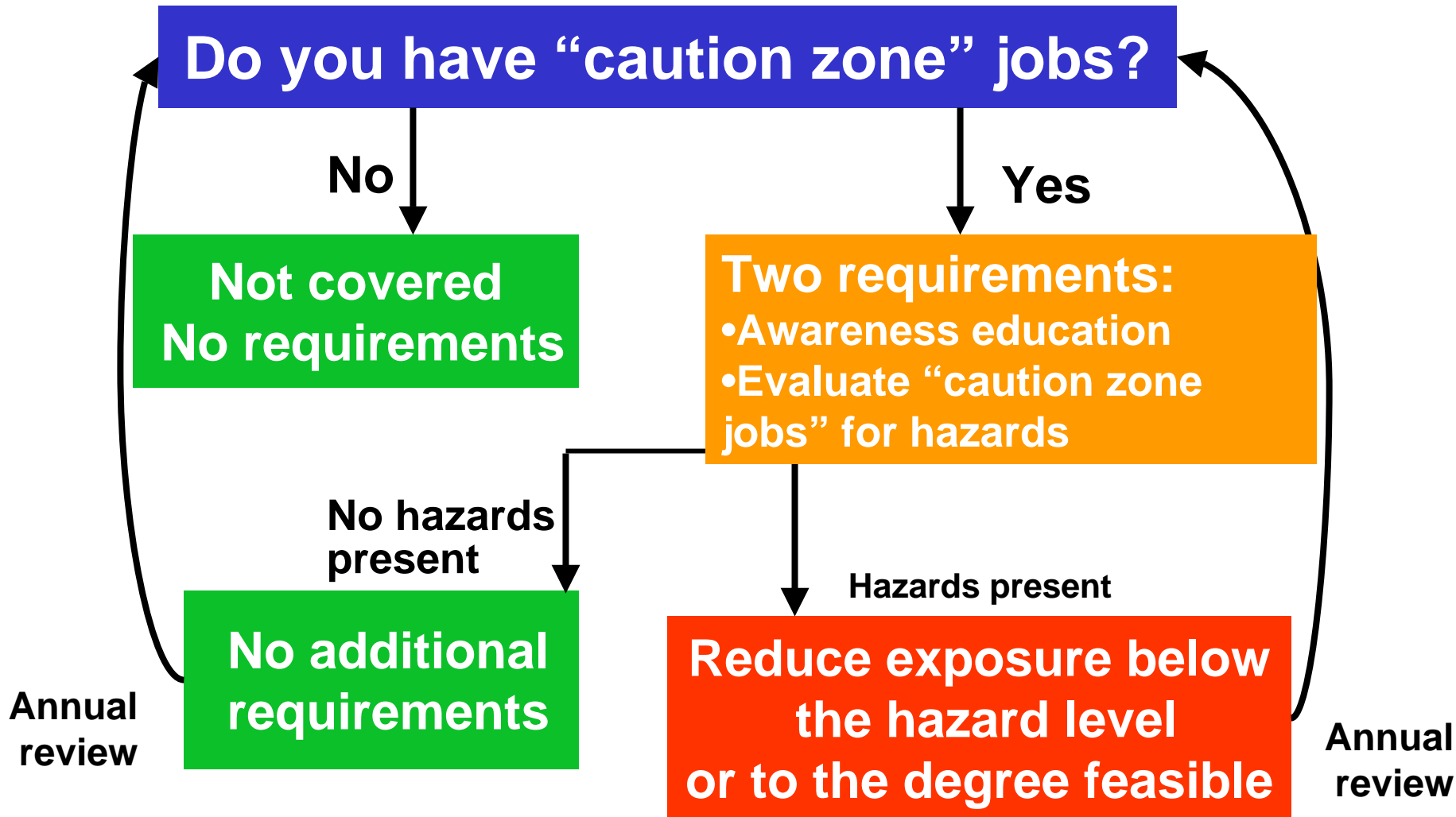
Promotes employee involvement and participation together with employers to analyze and fix hazards

– **You** play an important part...

...**You** can play an important part

- **You** may be asked to participate in:
 - Analyzing caution zone jobs for hazards
 - Finding solutions to these hazards
 - Evaluating the success of the solutions
- Later, **you** may...
 - be given job specific training on proper use of solutions
 - keep in touch with ergonomics efforts through the safety committee or at safety meetings.

Ergonomics Rule: Major features



Definition of ergonomics

- Ergonomics means

“fitting the job to the worker”

“Ergonomics is the science and practice of designing jobs and workplaces to match the capabilities and limitations of the human body.”

Ergonomics @ Work



Risk of injury - Heavy lifting



Cart reduces risk of injury

Benefits of ergonomics

- Ergonomics helps to prevent injuries
- Ergonomics has other benefits
 - Improved quality of work
 - Improved quality of life
 - Reduced fatigue and discomfort

Injuries and risk factors

Injuries and risk factors

- What are **W**ork-related **M**usculo **S**keletal **D**isorders (**WMSDs**)?
- Common types and symptoms of injury
- Causes and prevention of injury

What are Work-related Musculo Skeletal Disorders (WMSDs)?

- Also known as:
 - Cumulative Trauma Disorders (CTDs)
 - Repetitive Strain Injuries (RSIs)
 - Overuse injuries
- Soft tissue injuries
- Usually develop gradually, but sometimes can appear suddenly
- Can be serious, if not taken care of early

What are some of the symptoms of WMSDs?

- Discomfort
- Pain
- Numbness
- Tingling
- Burning
- Swelling
- Change in color
- Tightness, loss of flexibility

What causes WMSDs?

Risk Factors

- Awkward Postures
- High Hand Force
- Repetitive Motions
- Repeated Impacts
- Heavy, Frequent, or Awkward Lifting
- Moderate to High Hand-Arm Vibration

Risk Factors

Risk of injury depends upon:

- Duration (how long)
- Frequency (how often)
- Intensity (how much)
- Combinations of risk factors

Risk Factors

Duration

- usually need hours of exposure before risk factors become a concern
- Can be all at one time or cumulative over the day

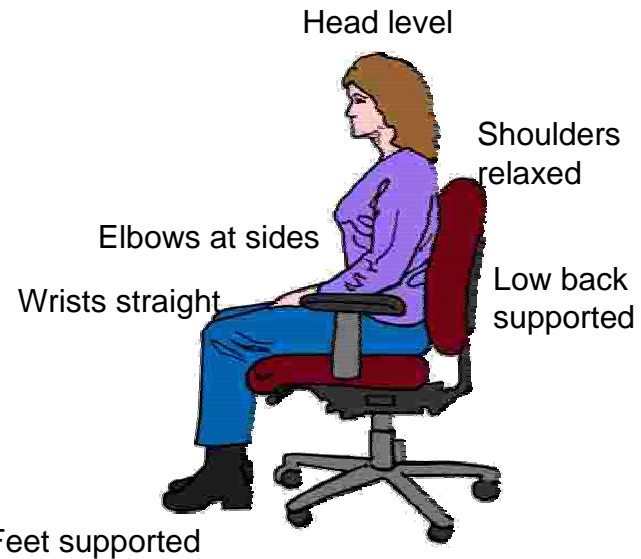
Risk factors for WMSDs

Awkward postures

Neutral postures



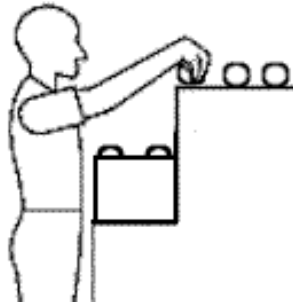
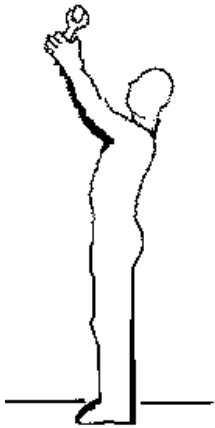
Standing neutral posture



Seated neutral posture

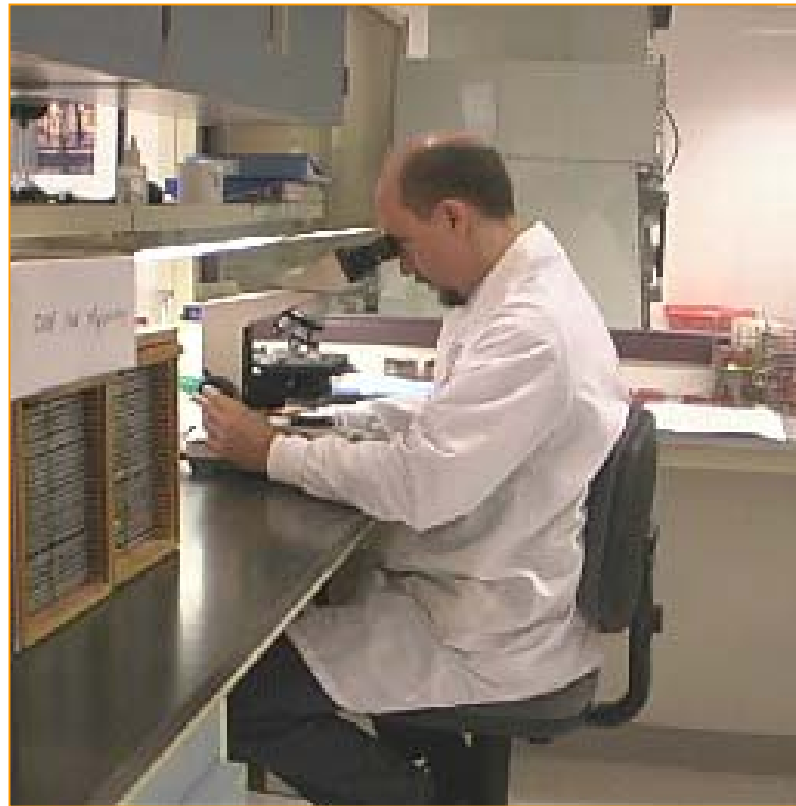
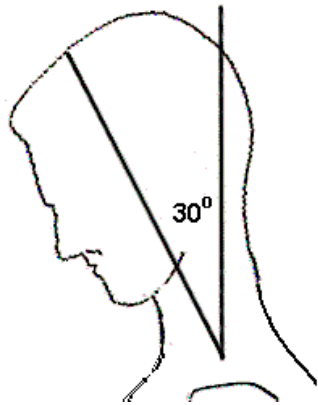
Hands over head or elbows above shoulders

For more than 2 hours per day



Neck bent more than 30°

For more than 2 hours per day



Back bent more than 30°



For more than 2 hours per day



Squatting



For more than 2 hours per day



Kneeling

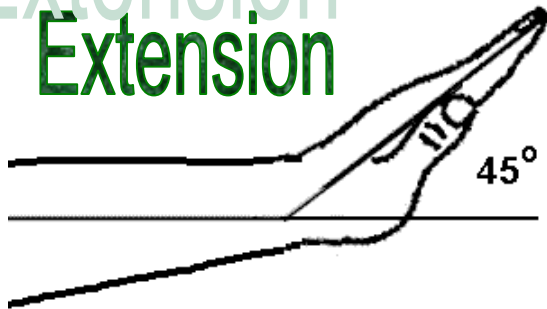


For more than 2 hours per day

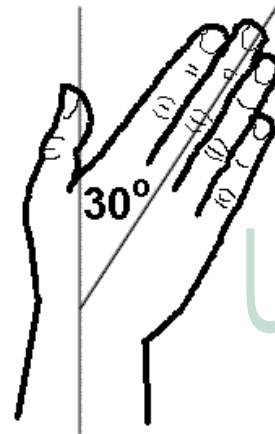


Wrists bent

Extension
Extension



Flexion
Flexion



Ulnar deviation
Ulnar deviation

Reducing awkward postures

- Change workstation heights & display heights
- Tilt or rotate the work
- Use platforms
- Bring items within easy reach
- Pause to stretch

Reducing awkward postures

Case Study

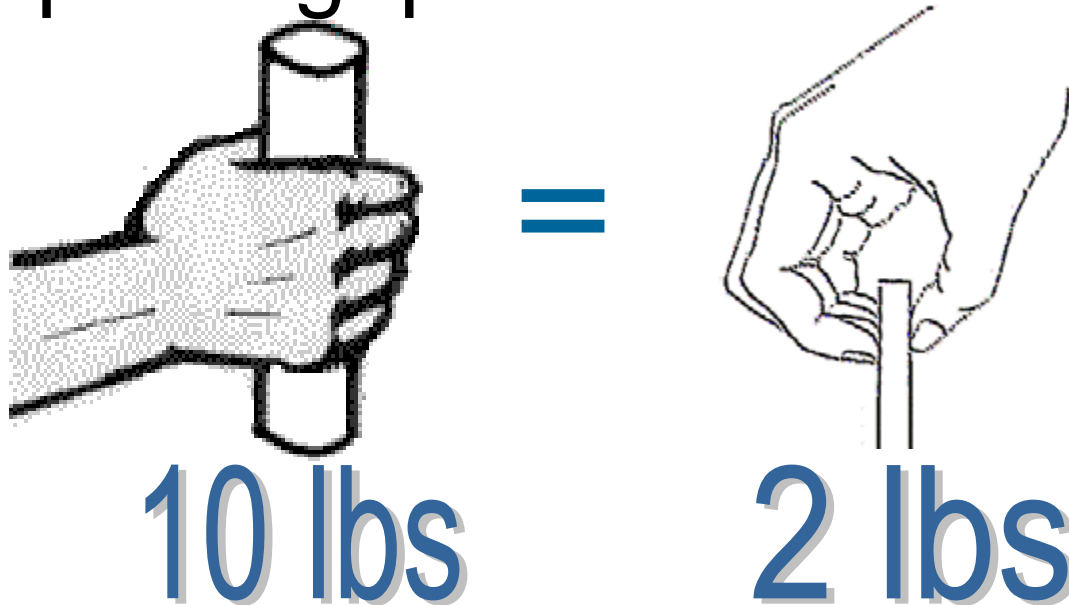


Risk Factors for WMSDs

High hand force

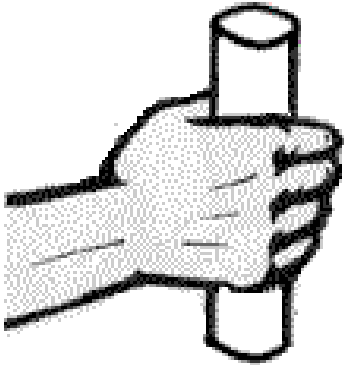
High hand force

A power grip can be 5 times stronger than a pinch grip



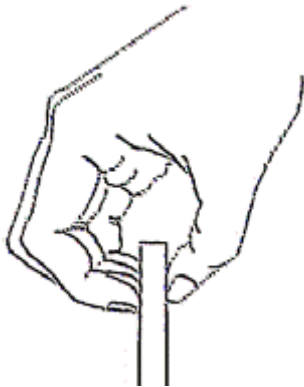
Gripping with the whole hand

10 lbs. of weight or force for more than 2 hours per day



Pinching with the fingertips

2 lbs. of weight or 4 lbs. of force
for more than 2 hours per day



Other factors

Your grip strength decreases when you:

- Bend your wrists
- Pick up slippery items
- Wear poorly fitting gloves
- Have cold hands

Avoid pinch grips

- Pick objects up from the bottom using whole hand
- Attach handles or use lift tools
- Build up handles on small tools to reduce grip force

Reduce power grip force

- Pick up smaller loads
- Use power tools instead of hand tools
- Keep tools in good working order
- Use lighter tools or tool balancers
- Use two hands
- Keep your wrists straight

Avoid holding onto objects for long periods

- Use clamps to hold onto work
- Place items on carts rather than carrying them
- Put down a tool when not actually using it

Use tool balancers

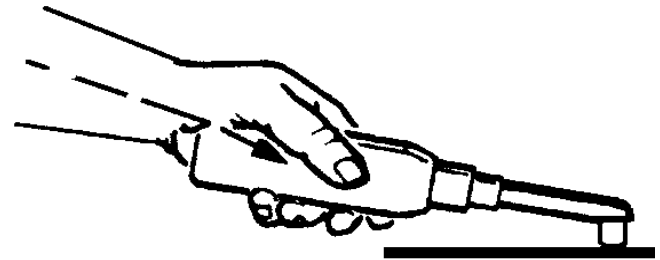
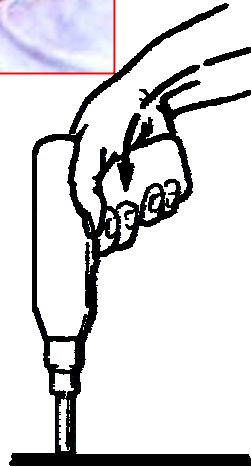
Case Study



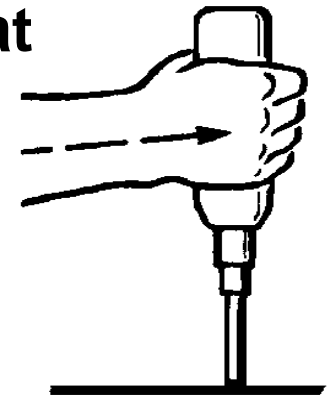
Tool use example



**Working with
bent wrists
decreases grip
strength**



**Use tools that
let you keep
your wrist
straight**



Risk factors for WMSDs

Highly repetitive motions

Highly repetitive motion

For more than 2 hours per day



Reducing repetition

- Arrange work to avoid unnecessary motions
- Let power tools and machinery do the work
- Spread repetitive work out during the day
- Take stretch pauses
- Rotate task with co-workers if possible
- Change hands or motions frequently

Reducing repetitive motions

Case Study



Intensive keying

For more than **4** hours per day



Reducing intensive keying

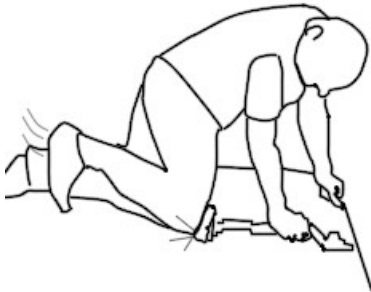
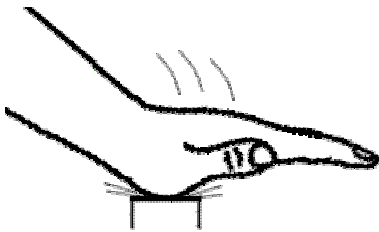
- Spread keyboard work throughout the day
- Use macros for common functions
- Take stretch pauses
- Improve your posture and move around as much as possible

Risk factors for WMSDs

Repeated impacts

Repeated impacts

Using the hand or knee as a hammer more than 10 times per hour, more than 2 hours per day



Avoiding repeated impacts

- Use tools instead of your hand or knee



Risk factors for WMSDs

Heavy, frequent or awkward lifting

Heavy lifting

- Lifting 75 lbs. once per day
- Lifting 55 lbs. more than 10 times per day



Reducing heavy lifting

- Take smaller loads at one time
- Use mechanical assistance - handtrucks, carts, hoists, conveyors
- Get help from a co-worker



Frequent lifting

- Lifting more than 10 lbs., more than twice per minute, for more than 2 hours per day



Reducing frequent lifting

- Use mechanical assistance
- Slide objects instead of lifting them
- Rotate lifting tasks with co-workers if possible

Awkward lifting

- Lifting more than 25 lbs. above the shoulders, below the knees or at arms' length more than 25 times per day



Reducing awkward lifts

- Store items where you won't have to bend or reach to lift them
- Use rolling stairs to get items down from high shelves



Safe lifting technique

DEMONSTRATION



Risk factors for WMSDs

Moderate to high hand–arm vibration

Vibration

Moderate levels
of vibration for
2 hours per day



High levels of
vibration for **30
minutes** per day



Reducing vibration

- Use low vibration tools if available
- Maintain tools →
- Use tool wraps or anti-vibration gloves
- Keep hands warm



What **you** can do:

- Recognize and report symptoms **early**
- Get involved in ergonomics

Symptom recognition and reporting

- Report symptoms if:
 - Pain is persistent, severe or worsening
 - Pain radiates
 - Symptoms include numbness or tingling
 - Symptoms keep you from sleeping at night

Why is it important to report symptoms **early**?

- Chronic injuries sometimes lead to disability, even surgery
- Early treatment more successful

Getting involved

- Look at jobs and help identify problems
- Come up with solutions
- Work with solutions
- Take part in training
- Take responsibility for changing the way you do your job
- Help to make sure efforts are successful

Six key points to remember

- 1 Ergonomics can help you on your job
- 2 WISHA requires Washington state employers to implement ergonomics if caution zone jobs are present
- 3 Risk factors can be reduced and WMSDs prevented
- 4 You can help your company put ergonomics changes into place
- 5 WMSDs can happen in jobs with risk factors
- 6 Reporting symptoms **early** is important

Complying with Washington's Ergonomics Rule: L&I's Ergonomics Ideas Bank

If you are currently connected to the Internet, you can visit the Ergonomics Ideas Bank by clicking on the picture below. Or you can type: <http://www.Lni.wa.gov/wisha/ergoideas> into your browser.

